# Construction Methods AND EQUIPMENT

1957 ROAD SHOW

ENGINEERING



First paving under the new 13-year highway construction program goes down on U.S. 40 in Kansas . . . p. 2



## A Specialist helps you select the wire rope best for your job

You can depend on your Yellow Strand distributor for recommending the right size and type of wire rope — and for ample stocks on hand.

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He knows exactly the rope to best fit your equipment for greatest wire rope service. He maintains stocks of standard strength Yellow Strand, Yellow Strand "POWERSTEEL" and Yellow Strand Flattened Strand to promptly supply your needs.

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### B. F. Goodrich All-Nylon tires average 3,000 hours' service on Florida Turnpike

THE unit above is one of a hundred operated by the Ralph E. Mills Company on the Florida State Turnpike. This contractor builds roads all over the world, owns numerous vehicles. Here the job is grading and filling, 25-ton loads of earth must be moved through soft, sandy soil—work that calls for real traction.

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B.F.Goodrich

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### February, 1957

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#### On the Cover

Dual pavers place the first section of heavy-duty highway to be built with funds provided by the 1956 Federal-Aid Highway Act. Job is an 8-mi section of U.S. 40 west of Topeka, Kansas, being built by the Koss Construction Co. of Pauline. State Highway Commissioner Ivan Wassberg celebrated the event by writing the date on the surface of the first finished concrete. When completed, highway will become part of the 41,000-mi national system of interstate and defense highways.





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February, 1957

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NEXT MONTH Have you ever come across lift slabs, post-tensioned beams and girders plus pre-cast columns, roof planks, and wall panels all on one job? Next month CM&E reports on how Gilbane Building Corp. of Providence, R.I., contends with all these construction techniques in building International Business Machine's multi-million-dollar plant in Kentucky.

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New"s

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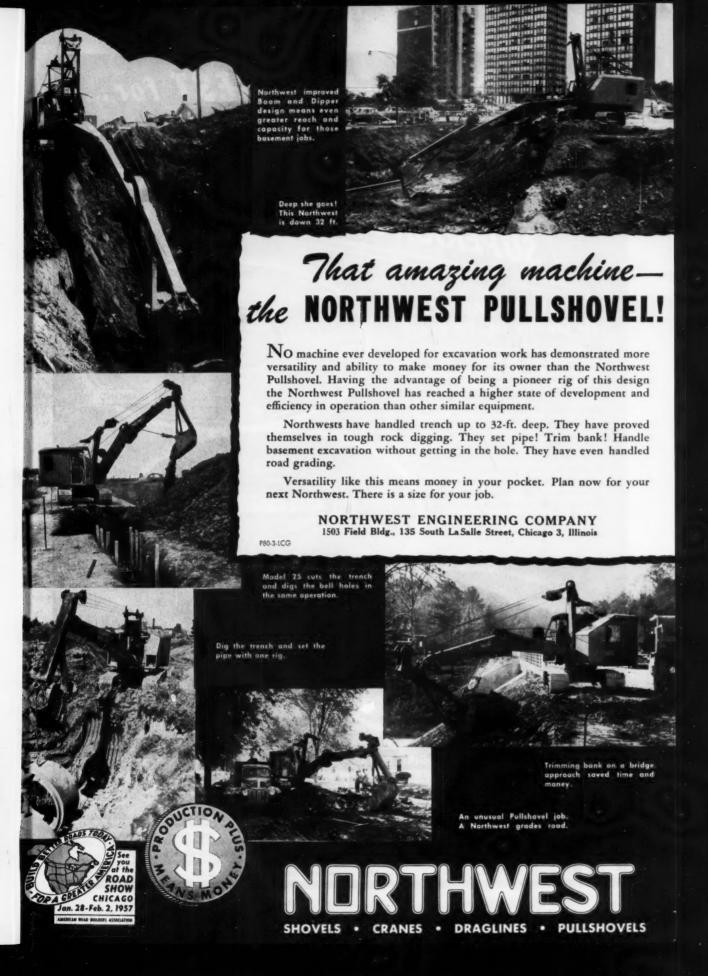
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### Construction News From Washington

Washington, D.C. February, 1957

### Good News in the Budget

Eisenhower's construction budget is good news: it's up—and big—right across the board. Public works of all kinds are affected, both civilian and military projects. All told, the budget shows that 7.5% of all construction is financed directly by federal dollars. And federally aided state and local projects account for another 5.5%.

Total spending for public works goes up 28% next year compared with this fiscal year—from \$4.9 billion to \$6.3 billion. Most of this increased business for construction is sure-fire—not dependent on new requests that Congress has to act on. The increase goes for projects already under way and for which Congress is committed to voting the needed funds.

Civil public works spending will increase 50% next year over this: up from \$2.5 billion to \$3.7 billion. The Bureau of Public Roads trust fund spending, for instance, shows a 45% rise—from an estimated \$1.1 billion this year to \$1.6 billion. Water resources projects will go up to \$976 million from \$786 million, or about 25%.

Military public works will go up about 15% from this year's \$2 billion to an estimate \$2.3 billion.

Spending next year on work already started will run \$1.5 billion, and an estimated \$6.2 billion will be needed to complete these projects. Expenditures for construction needing authorization by Congress will—if enacted—result in spending in fiscal 1958 of \$405 million, with \$1.6 billion needed to complete these projects. The proposed school construction program is the biggest single item here; it's the same program as Eisenhower proposed last year.

### **Declines Are Few**

Not all programs are on the increase, however. Looking through the budget message, you'll find some declines ahead:

Veterans' programs, for example, will show a drop during fiscal 1958. Hospitals and other facilities are getting \$46 million this year, but will drop to \$36.6 million next year. Parkways, roads, and facilities in national parks will drop from this year's \$52 million to \$47.8 million.

### Backlog Is Up

Backlog of planned projects keeps going up, too. All told, it's estimated that some \$12.3 billion of unstarted construction work has been authorized either specifically or by general legislation.

About \$8 billion of these projects are for the Corps of Engineers and the Bureau of Reclamation, a total of 618 projects. The Engi-

neers estimate their part of the backlog at \$5.2 billion; Reclamation has \$2.8 billion.

By the end of 1956, \$1.7 billion of this work was planned to the stage where construction could be started; but a year from now, it's estimated that \$3.4 billion in projects will be planned to this point. An additional \$4.7 billion of projects is now in various stages of advance planning; a year from now, about \$3.8 billion will be in some stage of advance planning.

### **Highway Investigation**

Congressional interest in all phases of the multi-billion highway program showed immediately as hearings got under way before the roads subcommittee of the Senate Public Works Committee. Top Administration officials and state highway officials were questioned, so were roadbuilders.

During the months ahead, the committee will get detailed answers to dozens of questions involving almost every section of the law.

The situation as to supply and demand for materials and engineers was one of the first to get attention—and the committee pressed for precise information on such materials as steel and cement. Congress was assured that contractors had the manpower to meet any possible construction schedule now foreseen.

Application of Davis-Bacon minimum wage rates on interstate mileage will be investigated. Of the rates fixed, Department of Labor in 9 out of 10 cases has used the minimums already in effect in the state. But contractors will be brought in for their view on how Secretary Mitchell is fixing minimums.

Senators Kerr and Gore want a report on highway mileage that is not now in the interstate system but is generally important from the viewpoint of traffic carried. The states have asked that an additional 12,000 miles be added to the presently authorized 41,000-mile system. Kerr and Gore want to know how much of this—if any—should be added.

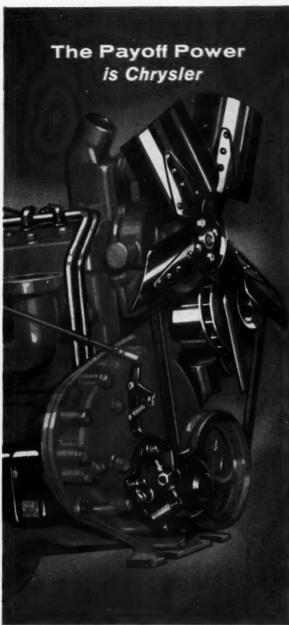
#### **New Construction Asked**

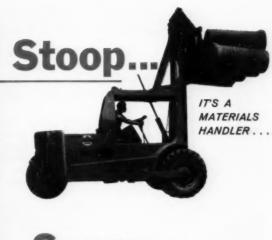
A lot of construction measures are being asked of Congress this year. A new request for authorization of the \$156-million Frying-Pan Arkansas Project will be backed by the Administration. It's the biggest single project the President wants authorized. Chances are only

Corps of Engineers would like to begin these projects already authorized:

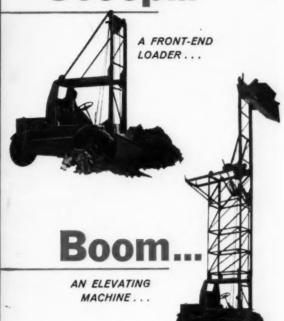
The \$100-million Allegheny River Reservoir crossing the Pennsylvania-New York boundary and the \$11.8-million North Hartland, Vt., Reservoir.

One project under consideration involves the high Pleasant Valley Dam on the Snake River in Idaho. Secretary of the Interior Seaton is asking the Federal Power Commission to postpone ruling on an application for two low dams to be built by private companies while he decides whether to recommend a high dam at Pleasant Valley.





Scoop...



CHRYSLER INDUSTRIAL 33, in-line 6 Engine (265 cu. in. displacement) powers the Model C Scoopmobile—and many other makes of equipment in the construction and materials handling fields. There are five Chrysler in-line 6s, two V-8s—ranging from 230 to 413 cu. inch displacement. For detailed information about Chrysler Industrial Power write: Dept. F2, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.



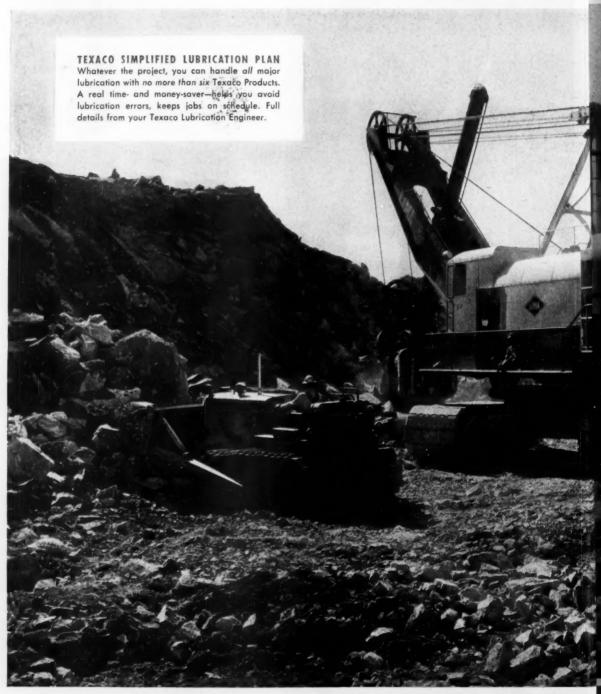
Here's a real "quick change" artist
—the Model C Scoopmobile! Nine
different attachments—all of which
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one man—give it exceptional on-the-job versatility. Single tail wheel provides greater maneuverability—especially in close quarters. Chrysler Power gives it extra guts and stamina—at lower operating and maintenance cost.

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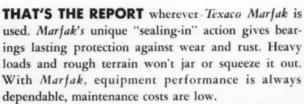
### Keeps





### Equipment on the job...





In wheel bearings, Texaco Marfak Heavy Duty seals out mud and moisture for thousands of extra miles—extends bearing life—assures safer braking. And no seasonal change is required.

If you prefer a multi-purpose lubricant, Texaco Marfak Heavy Duty Special 2 is the answer. This new lithium-base lubricant handles chassis, wheel bearing, water pump and other grease lubrication. It pumps easily at low temperatures, always lubricates effectively, resists water washing and stands up in the toughest service.

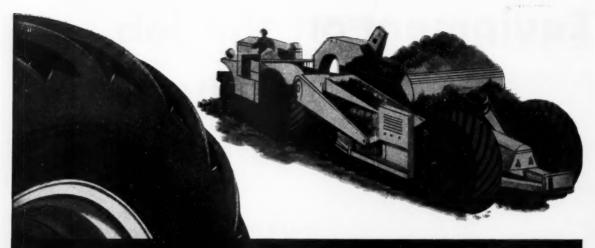
### MORE THAN 650 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

And don't forget: Texaco Universal Gear Lubricant EP for smoother-working transmissions and differentials—Texaco Track Roll Lubricant to fully protect and prolong the life of crawler mechanisms.

Let a Texaco Lubrication Engineer help you boost efficiency, cut maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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THIS DRIVE is atop a hot asphalt mixer. Extreme vibration plus heavy dust, oil, tar, moisture and exposure to weather kept maintenance up and belt life down to a five to eight weeks' average.

Then the G.T.M.—Goodyear Technical Mansuggested a matched set of COMPASS-V-Steel Belts, sinewed with airplane-type cables (see blueprint). These super-belts served a minimum of six months—have cut belt costs alone virtually in half.

Similar savings on V-belts or other industrial rubber products may be yours by consulting your Goodyear Distributor and/or the G.T.M. Why not try them, today? Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

-T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

**COMPASS-V-STEEL BELTS by** 

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THE GREATEST NAME IN RUBBER

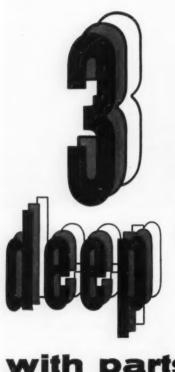
IT'S SMART TO DO BUSINESS with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."

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What does this mean? It means that your dealer is serviced from one of 19 nearby factory branches—or direct from the factory. Each branch carries a

stock of Allis-Chalmers parts and is staffed with factory-trained servicemen as well as sales engineers. This assures prompt attention whether you need a replacement part or technical assistance.

Ask your Allis-Chalmers engine dealer to show you how this 3-deep service can help on your specific engine needs. Write for literature and details.

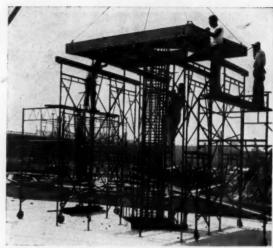
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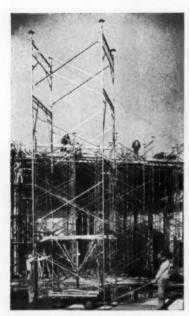


New Shoring Methods . . .

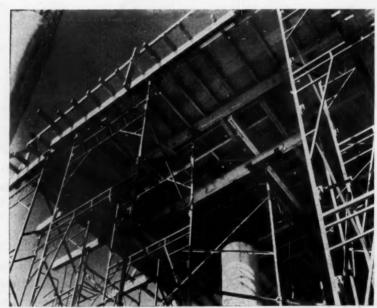
by Patent Scaffolding Co.



ROLLING SCAFFOLDS AID SHORING—"Trouble Saver"® Sectional Scaffolds make platforms for workmen guiding "prefab" drophead form being lowered by mobile crane onto 4x6 stringers. Donald F. Shaw uses this mechanized system on 3-story, 556' x 250' United Parcel Service bldg., Los Angeles. More than 2,700 "Trouble Saver" Shoring frames support formwork for 3" waffle-type floors.



DOLLY ASSIST—PS Co.-developed hydraulic, wheeled dollies speed the movement of entire prefabricated sections of "Trouble Saver" Shoring to successive pours on this huge 291' i.d. concrete reservoir at Reading, Pa.



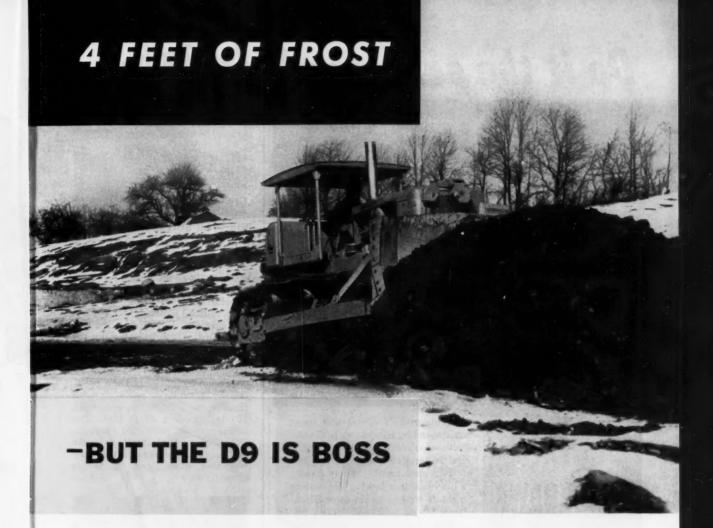
RESERVOIR SHORING—"Trouble Saver" Sectional Shoring frames support cantilevered, double 2" x 8" stringers around drop head under concrete slab for the same reservoir reported, left, on which B. F. Ziegler Construction Co. is the general contractor. Curved dome varies from 28' to 31' high. Assembled shoring sections are moved to new pour locations on PS Co.-developed hydraulic, wheeled dollies, and by caster attachments, similar to those shown in the photo above.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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Boss of all bulldozers is the giant Caterpillar D9 Tractor. When this picture was taken last winter, John Arborio, Inc., was moving 1½ million yards of frozen earth, 75% of it rock, to build a section of Route 17 in Sullivan County, N. Y. With four feet of frost in the ground, conditions were about as tough as possible.

That, didn't stop the D9. With its CAT\*-built No. 9S blade, this machine weighs over 34 tons, and its broad tracks with hardened steel grousers give it tremendous 'dozing traction. It has the *power* to dig into hard ground, too—320 HP at the flywheel, and 98,000 pounds maximum drawbar pull!

In repeated tests where accurate records have been kept, one D9 has outworked *two* bulldozers of the next size. Blade loads average 12 cubic yards of earth and are handled at higher speeds. On 'dozing hauls up to 100 feet, cycle times average less than  $1\frac{1}{2}$  minutes, and production runs up to 600 cubic yards per hour.

The D9 is big, heavy and ruggedly built to lick the toughest jobs. Yet, with its power-boosted controls and excellent visibility, it's one of the easiest of all tractors to operate. Maintenance is easy, too. The D9 is available with either torque converter or direct drive with oil clutch.

Your Caterpillar Dealer can show you performance records that prove the real economy of the D9 as a bulldozer, pusher or hauler. And he stands behind the long life of every machine with reliable, round-the-clock service and parts you can trust. See him today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

### CATERPILLAR\* \*Caterpillar and Cut are Registered Trademarks of Caterpillar Tractor Co.



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· Thousands of contractors insist on, depend on Blackhawk hydraulic jacks to save time, money, labor and materials - right on the job!

Two men (above) safely handle a heavy column jacking job, replace a whole crew - using three Black-

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GAUGE-EQUIPPED HYDRAULIC JACKS -- ideal for testing weight-bearing capacities of soil, road surfaces up to 100-ton capacities.



BLACKHAWK MFG. CO., Dept. J-2327, Milwaukee 46, Wisconsin

### Job Talk . . .



#### **Bin Wall Solves Fill Problem**

Wanting more room for storage tanks, a Cincinnati chemical company found the only space it had available was an area behind its building that was lower than the general grade of the property. A busy railroad siding came adjacent the property line and ruled out filling in the land behind a normal retaining wall. Forms for the wall construction would have forced interruption of railroad traffic.

The contractor solved the problem by building a retaining wall from Armco's metal bin-type wall, 160 ft long and 16 ft high. The bin-type wall permitted easy installation without tying up traffic and gave the chemical company workable land right up to its property line.



#### Gin Poles & Crane Team Up

Teaming two gin poles with a crane helped solve a tough problem for Procon, Inc., contractor on the Cosden Petroleum Corp's Big Spring, Texas, refinery.

Steel shortages forced the contractor to complete the job then return to place six huge steel towers that should have been installed early in the course of work. The towers measure 90-in. in dia, stand 111 ft high, and weigh 130,-000 lb. Bringing them into the job and raising them within a network

of concrete, piping, and wiring figured to be tricky.

This is how it was done. A tower was dragged into the job through a 30-ft-wide aisle that had been left for it. Two gin poles were erected on either side of the pier on which the tower would rest. Cables from the gin poles ran down and connected to a strap placed around the upper third of the tower.

A strap also was placed around the bottom end. When lifting time came, a crane raised the bottom several feet off the ground. As the gin poles lifted the tower, the crane moved in with the bottom, keeping it free from the ground and fixtures until the tower was securely set on its concrete pier.



#### Ice Tongs Lift Stringers

Looking for a way to handle precast concrete pieces fast and economically? J. Rich Steers, Inc., uses ice tongs suspended from strongbacks to handle 19-ft pre-cast, pre-tensioned deck stringers on its Pier "C" rehabilitation job in Hoboken, N. J. Pull up on the lift cable, the tongs grip. Relax the lift cable, the tongs release their grip.



#### Beat Drums to Get Tar

Getting black top slugs out of 50gal drums and into workable state always is a problem. But contractors working on Thule Air Force Base for the Corps of Engineers

### Do it the easy way!



ery type of construction job say after they've used efficient Blackhawk Porto-Power.

For example, this remote-control 20ton Porto-Power jack with hand-operated pump (above) cuts bucket repair time in half! No more pounding or prying. You do it the easy way with smooth, steady hydraulic power!

And remember! Only BLACK-HAWK builds the world's most complete line of hydraulic power tools all necessary pumps, rams, work attachments, valves and cylinders for 1001 construction jobs. Don't delay! Order from your construction equipment supply house today!

### FREE "IDEA BOOK" shows how these BLACKHAWK JACKS do everything but walk and talk!



Blackhawk Mfg. Co., Dept. P-2327, Milwaukee 46, Wisconsin

Please send me free Blackhawk "Idea Book" — successful shortcuts others use to solve maintenance, testing and production problems.

COMPANY ...

ADDRESS ...

### BLACKHA

BLACKHAWK MFG. CO.

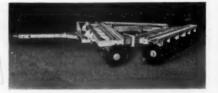


Perfect base finishing tool for stabilizing, aerating and mixing base materials on fills or cuts on highways, dams, airports and levees is a Rome Disk Plowing Harrow. It spreads and smooths off surface irregularities, cutting and mixing base materials to a depth of 9" or more per pass, leaving soil in a mellow condition for thorough, dense compaction.

When your job calls for pioneering through small trees and underbrush — a nuisance for bulldozer equipment — call out the Rome. It cuts and chops dense growth, often removing roots and all. Ideal for right-of-way maintenance, and an essential step in site preparation.

Whatever your base preparation, dirt moving or clearing problem, there's a Rome Disk Plowing Harrow to match your needs and your equipment. See your Rome-Caterpillar Dealer for all the facts.





Rome Disk Plowing Harrows
ROME PLOW COMPANY . CEDARTOWN, GEORGIA

cook a slug every 3 min with a neat production-line technique.

Drums are delivered to an opener shed built over kettle and firepit. A small chain hoist lifts the drum off the trailer and sets it upright on a block where a workman with a pneumatic chisel makes one cut all around the drum just under the top seam and a similar cut just above the bottom seam.

The drum then is tipped on its side where the workman makes a long cut down one side to join the first two cuttings. Two holes then are punched through the metal casing at the center to serve as seats for moving hooks.

Top and bottom disks are knocked off. The hooks from the chain hoists are set in the holes, and the drum is lifted and carried over the kettle where a workman strikes it with a sledge hammer. The blow causes the metal wrapper to unroll and the slug to fall into the kettle.



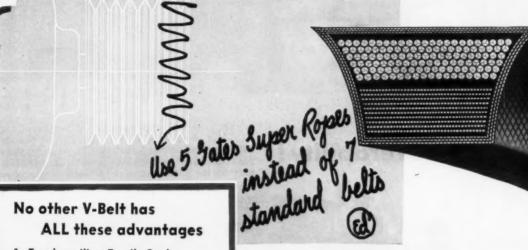


#### Mobile Batcher Flees Flood

Flash floods that could wash away a fixed batching plant installation were a threat to Bechtel Corp. during building of a powerhouse for Pacific Gas & Electric Co. on the Feather River in California. A gravel bar on the river bank was the logical site for a concrete batch plant. But the flood danger seemed to force selection of an expensive alternate site 110 ft up a canyon wall.

Bechtel solved the problem with a Noble-Mobile portable batch plant. This plant made it possible to use the river bank site. The plant's mobility permitted moving it to higher ground on short notice when floods threatened.

### Get more HP delivered per \$ of drive cost



### **ALL** these advantages

#### 1. Tough, resilient Tensile Cords



Super-strength tensile cords provide 40% greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required . . . save weight and space.

#### 2. Concave Sidewalls (U.S. Pat. 1813698)





Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . far longer belt life.

#### 3. Flex-Weave Cover (U.S. Pat. 2519590)



A Gates exclusive provides greater flexibility with far less stress on fabric. Cover wears longer . . . increases belt life . . . more power available to driven machine.

#### 4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

#### 5. Oil, Heat, Weather Resistant

Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure.

### Cut sheave width and weight with Gates Super Vulco Ropes

You save on cost of iron ... you reduce bearing width and support . . . you save space and overall cost . . . when you design a drive using Gates Super Vulco Ropes. Here's why:

#### **5 Gates Super Vulco Ropes** do the work of 7 standard V-belts

That's because Gates Super V-Belt has 40% more horsepower capacity than standard belts. Therefore, you can reduce sheave width and weight . . . cut cost.

A wealth of drive data is quickly available to you. Simply call your nearby Gates V-Belt Distributor (see 'phone book yellow pages) for a Gates V-Belt specialist. Stocks available in industrial centers around the world. The Gates Rubber Co., Denver, Colorado-World's Largest Maker of V-Belts.



Gates Super VILCO Drives

### **New capacity!**

The completely new Forward Control 'Jeep' FC-150the first time a 4-wheel-drive Truck has so effectively combined maximum cargo capacity with exceptional maneuverability! New Forward Control design puts a 74" pickup box on an 81" wheelbase. And the FC-150 retains famous 'Jeep' ruggedness and versatility.



### **New maneuverability!**

It's the world's shortest turning 4-wheel-drive Truck! For safer off-road maneuverability, it gives you up to 200% greater forward visibility. Powered by the engine that made 'Jeep' vehicles famous, the new FC-150 provides the extra traction of 4-wheel drive for off-road



### New style!

The new look and feel of tomorrow! The FC-150's Safety-View Cab combines beauty with utility. Its new wrap-around windshield is the largest in the 5,000 GVW class. There's plenty of extra leg and head room. Here is new styling, comfort, convenience and safety all in today's most advanced 4-wheel-drive Truck.



New Jeep | Forward Control

4-Wheel-Drive

... other members of the famous 'Jeep' family:



Universal 'Jeep'

'Jeep' Truck



'Jeep' Utility Wagon

Willys... world's largest makers of 4-Wheel-Drive vehicles

See 'Jeep' vehicles at your WILLYS dealer



BUCYRUS

Your kind of machine...

### the new 30-B

#### MODERN, PROVED DESIGN

The 30-B offers you proved, advanced design features that have made Bucyrus-Erie crane-excavators outstanding performers on all types of work.

Parts are simple, generous in size, few in number—with plenty of strength for dependable service without unnecessary weight to reduce working efficiency.

Air controls are easy to operate, conveniently placed, accurate. Hoist, crowd or drag, swing or propel, and steering clutches, as well as digging and swing brakes and dipper trip are air controlled.

Loads are distributed properly between upper and lower works by six conical hook rollers two equalized pairs in front and two singles in rear. Precise machining, heat treating and flame hardening provide smooth rotation and long life.

Special greasing system, with remote control located at operator's position, for greasing swing pinion and rack; grease fittings grouped to save time.

#### TAILORED TO YOUR NEEDS

Choice of crawler mountings—five different sizes of crawlers and treads to fit requirements. Also, Transit Crane on rubber-tired carrier.

Power and drive options—crawler-mounted 30-B offered with gasoline, diesel (direct or torque converter drive) or single motor electric power.

Transit Crane—gasoline or diesel, 35-ton capacity.



Five front ends—both crawler machine and Transit Crane fully convertible to shovel, dragline, clamshell, crane, dragshovel.

Extra equipment for special jobs—includes various-length crane booms and jib extensions, independent propel, third drum unit, cathead, power controlled lowering on main hoist line.

Let your Bucyrus-Erie distributor give you all the facts on the all-new 30-B, show you why it is the *right* machine for your job. See him soon—or write for complete details.

**BUCYRUS-ERIE COMPANY** 

SOUTH MILWAUKEE, WISCONSIN

### **Outlook for Equipment in 1957**

- Sales . . . up 10%, maybe more
- Deliveries . . . no
   stretch-out for most lines
- Prices . . . expect a general rise at mid-year
- Financing . . . will remain hard to get

CONSTRUCTION CONTRACTORS expect to spend 10% more on new excavating and earthmoving machines this year, on top of last year's 30% increase. In fact, some equipment makers expect to show an even heftier sales rise than this Construction Methods forecast for the industry as a whole.

Manitowoc, for one, sees our estimate as a little low. Frank G. Hough has a very rosy outlook, according to G. A. Gilbertson, president, who says, "The trend toward additional use of rubber-tired front-end loader equipment... has made it necessary for us to increase 'Payloader' production schedules for 1957 by more than twice the estimated industry average of 10%."

Though some firms will do better than others in terms of sales increases, a three-to-one majority of manufacturers checked by Construction Methods believe that a 10% sales rise this year is about right.

This prospect of a new sales record raises the possibility that some types of equipment may become short—because, if new orders may come in so fast that equipment orders can't keep up with them, delivery waits will stretch out.

Right now, two out of three manufacturers expect they can handle a 10% rise in orders without stretching out deliveries. Increased plant capacity will help some makers take a substantial increase in orders without affecting delivery schedules. Hough's plant expansion "has made it possible for us to reduce our backlog of orders

and improve our delivery position while processing an additional volume of new orders," according to Gilbertson.

But there are some firms that believe a 10% rise in sales will result in longer deliveries. Marion Shovel, for example, expects delivery waits to lengthen on intermediate sizes of its line. Dart Truck sees a possible stretchout in deliveries. International Harvester may take longer to deliver if there's a "burst" in new orders.

Delivery Time—The number of weeks between the time a contractor places his order and the time the factory ships the rig varies greatly by type of machine, size, and manufacturer. Maximum waits are the longest for power shovels, draglines, cranes, and off-highway trucks. On many models of shovels and draglines maximum waits for sizes over 2 cu yd are two and three months. So contractors

should move fast in ordering new equipment they'll need in 1957.

Current minimum and maximum delivery times (order to factory shipment date) for different types of equipment are shown below, as reported by 11 manufacturers:

- Power shovels: under 2 cu yd, minimum waits range from 1-3 weeks; maximum, 2-8 weeks; over 2 cu yd, minimum is 2-8 weeks; maximum is 5-12 weeks.
- Draglines: under 2 cu yd, minimum is from stock to 2 weeks; maximum is 5-8 weeks; over 2 cu yd, minimum is 2-8 weeks; maximum is 5-12 weeks.
- Crawler cranes: minimum is from stock (smaller models) to 4 weeks; maximum, 5-8 weeks.
- Truck cranes: minimum is 2-10 weeks; maximum, 3-20 weeks.
- Off-highway trucks: minimum is from stock to 8 weeks; maximum, 6-20 weeks.

continued on page 30

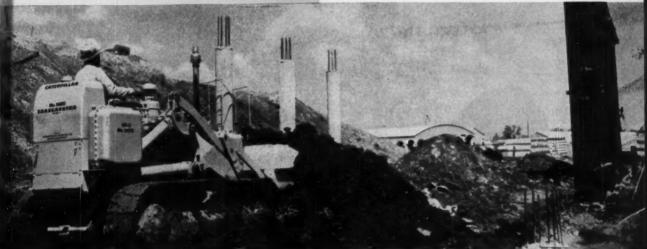
### **Heavy Construction Forecast for 1957**

Contract Awards as reported	-,		% Change		nange
	1955	1956	1957	1955-	1956
	Actual	Actual	Forecast	1956	1957
All Heavy Construction	\$18,722	\$21,712	\$23,125	+16	+
Other than Building	5,991	6,602	8,045	+10	+2
Waterworks		356	390	+13	+1
Sewerage	402	579	600	+44	+
Bridges	546*	622*	725	+14	+1
Highways	2,137	2,475	3,200	+16	+2
Earthwork, irrigation,					
and drainage	546	730	930	+34	+2
Unclassified	2,046	1,840	2,200	-10	+2
Private	925	787	1,000	- 15	+2
Public	1,121	1,053	1,200	- 6	+1
Building	12,731	15,110	15,080	+19	-0
Private	10,744	12,693	12,750	+18	+0
Industrial		5,335	4,800	+81	- 1
Housing	6,138	5,307	6,050	- 14	+1
Commercial		2,051	1,900	+24	-
Public	1,987	2,417	2,330	+22	-
Excluding housing	1,741	2,099	2,000	+21	-
Housing	246	318	330	+29	+
otal Private		13,490	13,750	+16	+
Total Public		8,222	9,375	+17	+1
State & Municipal		6,533	7,375	+21	+1
Federal	1,635	1,689	2,000	+ 3	+1

# "ONE DEMONSTRATION OF THE NO. 955 TRAXCAVATOR' AND I WOULDN'T LET THEM TAKE IT BACK!"

F. V. Minor, Dallas, Texas





F. V. Minor had a subcontract from Austin Bridge Co. to dig bridge abutments and clean up dirt along a railroad overpass retaining wall west of Dallas. Theearth was packed hard and when he tried to use a loader of another make, he found the machine just couldn't get into it.

Then the Caterpillar Dealer brought a No. 955 Traxcavator out to demonstrate. And once he'd seen how it did the work, Mr. Minor wouldn't let them take it away. A lot of other contractors know just how he felt. The Caterpillar No. 955 Traxcavator has been a success from the day it was introduced. It really licks the tough jobs.

This fast, efficient excavator-loader has a 1½-cu.yd. bucket, 80 inches wide. A dependable 70 HP CAT\* D315 Engine gives it plenty of digging power in tough materials. The bucket has full 40-degree tilt-back at ground level to prevent spillage, and 128-inch lift height for easy loading.

Operators like the No. 955 for its exceptional visibility and fast-acting hydraulic controls. Bucket lift and tilt levers are positioned for easy one-hand operation. And the exclusive Caterpillar oil clutch adds to long work life and reduces maintenance.

If you've got a difficult excavating problem, ask your Caterpillar Dealer to demonstrate a Cat-built Traxcavator right on your job. In addition to the No. 955, he can show you the No. 933 (1 cu. yd., 50 HP) and the No. 977 (2½ cu. yd., 100 HP). He'll prove to you that they're built to do more work and harder work at lower cost. You can count on him, too, for prompt, reliable service and parts you can trust. Talk to him today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

### CATERPILLAR\*

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

### Cement hauler in a hurry chooses STANOLUBE

Dawson-Springer gets 250,000 miles between overhauls, 3,000 miles between oil changes



J. T. Springer (left) and Bob Dawson (right) discuss lubrication proposal with Standard automotive lubrication specialist Jim Depp. Jim is well qualified to give technical service on lubrication. He has been doing work like this at Standard Oil for 11 years. Customers find this "know-how" of Jim's a big help to them in keeping trucks in service and costs down.

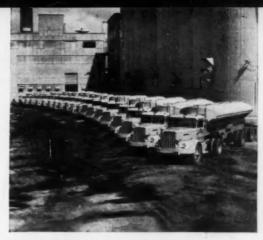
### **HD-M Motor Oil**

Dawson-Springer hauls cement from Manitowoc, Wisconsin. The company has mighty tight delivery schedules. There is no time to spare for down time due to lubrication failure. Dawson-Springer uses Stanolube HD-M in all of its 20 heavy duty power units. Units are fueled with Stanolex Diesel Fuel and Standard Red Crown Gasoline.

Jim Depp, Standard Oil automotive lubrication specialist began making calls on J. T. Springer and Bob Dawson as soon as they began business. He worked with them from the start, followed operations, gave recommendations on lubricants, greases and fuels to use. The lubricant he recommended—STANOLUBE HD-M—plus the attention he has given Dawson-Springer's equipment has meant money in the cash box to this company. They have never had trouble with any unit due to lube failure.

STANOLUBE HD-M Motor Oil fits requirements of Dawson-Springer's equipment. Stanolube HD-M is refined from highest quality base stock. Special additives have been incorporated. Additives retard oxidation, minimize formation of piston and ring belt deposits, prevent formation of excessive varnish and sludge and prevent corrosive attack on corrodable bearing metals.

Get this superior lubrication for your trucks. Get facts about Standlube HD-M Motor Oil from your Standard Oil automotive lubrication specialist. There's one near you in any of the 15 Midwest or Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Ill.



Ten Macks and ten AutoCar units — both gas and diesel powered—make up the Dawson-Springer fleet.

### Quick facts about STANOLUBE HD-M MOTOR OIL

- Refined from highest quality, solvent extracted, base stocks.
- Contains special additives that prevent bearing corrosion, reduce piston varnish and keep rings free to seal against blow-by.
- 3 Contains still other additives that reduce wear of heavily stressed parts.



STANDARD OIL COMPANY

(Indiana)



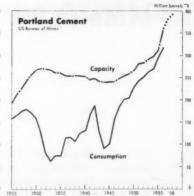
Older units in Dawson-Springer fleet are overhauled every 250,000 miles. New units haven't been touched. Oil is changed and chassis lubricated at 3,000 miles.

#### IT'S YOUR BUSINESS ...

continued from page 26

- Crawler tractors: minimum is 3-5 weeks: maximum, 4-8 weeks.
- Wheel tractors: maximum is two weeks to 30 days.
- Scrapers: 30-day maximum for one make; three-week minimum for another make.
- Front end loaders: some from stock; maximum wait is six weeks







Disengagement of ROCKFORD Over-Center Clutches is positive. It is accomplished by a linkage arrangement which is counterbalanced to offset the effects of centrifugal force — prevalent in modern high-speed engines. Give your product this and several other advantages — by specifying a ROCKFORD clutch.

### **ROCKFORD Clutch Division BORG-WARNER**

1331 Eighteenth Ave., Rockford, III., U.S.A.

Export Sales Bory-Warner International — 36 So. Wabash, Chicago 3, III.

0000000

Prices to Rise—Nearly half of the manufacturers reporting indicate that they will be raising their prices within the next six months. Thus it looks as if the uptrend in equipment prices, which jumped 8.7% on the average during the 12 months of 1956, will continue this year.

Furthermore, just about all of the equipment makers reporting say they'll raise their prices in the second half of the year if there's a steel price increase at mid-year. Because the steelworkers will receive a pay increase at that time under the terms of their current three-year contract, a steel price rise to cover this wage increase is a strong possibility.

### Impact of "Tight Money"

The "tight money" situation has put a dent in the construction boom because new capital in the form of bank loans or borrowings from the capital markets has run short of demand and is much more expensive. Not only has this affected the volume of new contracts available to contractors, but it also has forced some contractors to conserve their working capital. This is so because they have been finding it progressively tougher to borrow all the working capital they need from the banks. And on equipment loans, some banks are requiring contractors to leave bigger balances of their equipment loans on deposit with the bank.

This money problem has caused some slackening in sales of equipment to medium and smaller contractors. For instance, sales of smaller size power shovels—38, ½ and 34 yd models—are "soft", according to M. B. Garver, vice president and sales director of Thew Shovel Co. He says, "Unless the money market situation improves and help increases, we expect this



# Diesels in both carrier and "upper"... an unbeatable power combination for cranes



Mr. Black, President of Superior Trucking Company, Atlanta, Georgia, says, "We have had marvelous success with our P&H Diesels and consider them in a class by themselves. Besides the one source responsibility, we especially like the quick starting and operating economy of P&H Diesels. Our operators, who rely on infinite control of loads, like the slow speed characteristics possible with the P&H Engine in the "upper", heretofore unheard of in crane use."

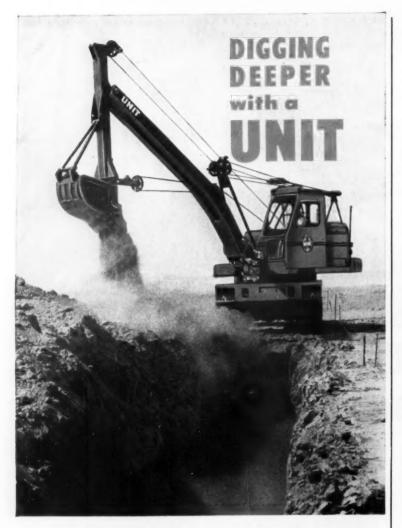
When you standardize on P&H Diesels for complete powering of your truck cranes, you get the right engine for the right job! The P&H Automotive Engine in the carrier gets you between jobs fast. The P&H Industrial Engine in the "upper" helps you handle any crane assignment with slow, sure, steady power for maximum control, production and safety.

It will pay you to specify complete P&H Diesel powering for your new truck crane or next repowering job.

### HARNISCHFEGER

P.H DIESEL ENGINE DIVISION, Crystal Lake, III.

P&H Diesel Divis	ion- Dept. 402-	Α -
Gentlemen:		
Please send me you Your Truck Cranes		perating Cost For
Name		
Company		
Street		



### You'll Dig More Jobs At More Profit With A UNIT TRENCHOE!

Accurate deep digging of trenches for pipelines, sewers, water connections, footings, basements and culverts is easily and quickly accomplished with a UNIT Trenchoe. The "Goose-neck" boom with its long deep reach assures maximum production. Also saves time trimming vertical sidewalls and corners, and in leveling floor surfaces. Powerful...Compact...Perfectly Balanced. Every UNIT is designed to meet the most rigid demands. Investigate today and earn more pay.



### IT'S YOUR BUSINESS ...

situation to continue because the people who buy these machines are medium size contractors who require considerable financing."

Money is apparently not going to "ease" during the next two or three months, and this condition could hurt 1957 construction equipment sales to some extent. A Marion Shovel spokesman said in connection with the Construction Methods forecast of a 10% rise in this year's sales: "This will depend materially on the availability of funds to finance purchases of new equipment."

Clearly, a contractor who plans to finance new equipment purchases in the first half of 1957 should arrange the credit he needs before he ties himself down on new construction contracts.

### Construction Business Will Be Good This Year

Tight money or no, contractors should end up with more new business this year than they took on in 1956. CM&E's official forecast for this year is a 7% increase over 1956's all-time high to a record breaking \$23.1 billion. (See table p 26.) This official forecast is about the same in dollar total as our preliminary forecast (CM&E, Oct, 1956, p 26). But the percentage rise is less than the preliminary forecast of 10% because 1956 wound up with a bigger total than we estimated last fall.

The outlook for heavy construction other than building is bright. Awards for highways, bridges, dams, tunnels, waterworks, sewerage, airports, and other types of work in this category are expected to climb 22% to \$8,100 million. Highways, up 29%, and earthwork-irrigation-drainage, up 27%, will spark this rise.

Building contract awards should equal last year's \$15.1 billion. Increases of 14% in private housing and 4% in public housing volume will offset declines of 10% in industrial building, 7% in commercial building, and 5% in public building other than housing.

"Capehart" military housing is counted on to bolster private housing contracts, a category that showed a 14% drop in 1956. (This housing is included in private work because it's privately financed and privately owned.)

continued on page 244

### "Phillips 66 Lubrication Engineers are Johnny-on-the-spot to keep our equipment fully productive"

 Lee McLean, Jr., President McLean Construction Company Springfield, Missouri





McLean equipment grading and widening new Commercial Street Trafficway in Springfield.



20,000 yards of earth were moved in grading and preparation of modern, new trafficway.

### "WHENEVER WE'VE NEEDED HELP on

knotty maintenance problems, Phillips 66 lubrication engineers have been prompt with valuable technical assistance," says Lee McLean, Jr. "We value this help so highly that, for the past three years, we have been an exclusive Phillips 66 customer."

McLean Construction Company specializes in earth moving, highway construction, plant site preparation and municipal work. It operates more than 60 pieces of equipment.

Phillips 66 lubrication engineers can help you with your maintenance problems, too. Phone, write or wire today and we'll have one of our division men on the way. Sales Department, Phillips Petroleum Company, Bartlesville, Okla.

### PHILLIPS 66 HEAVY DUTY MOTOR OILS



Remember: IT'S PERFORMANCE THAT COUNTS!

### Which Diesel's the picko



### It's GM-used by more than 150 equipment builders

Producing rock and crushed stone for America's gigantic road-building program is a slam-bang operation that calls for rugged equipment with plenty of get-up-and-go.

It's a "natural" for General Motors Detroit Diesel engines because these compact, quickaccelerating two-cycle Diesels outwork other engines—both gasoline and Diesel—on any job from 30 H.P. up.

This fact—plus world-wide service availability—explains why more than 150 manufacturers install

GM Detroit Diesels in over 1000 different applications of power machinery.

These dependable Diesels are the choice of pit and quarry operators in portable air compressors, dredges, rock crushers, shovels, scrapers and other heavy hauling units.

Your nearby distributor or dealer welcomes the opportunity to show you the savings you can make with GM Detroit Diesel power on your job. It's America's First Choice Diesel because it does more work at less cost!

Single

# of pits and quarries?



Shown above: Pioneer Portable Rock Crushing Plant: Bucyrus-Erie shovel; Koehring Dumptors: Chicago Pneumatic rotary compressor; Joy rotary drill; Wooldridge "Cobrette" scrapers; Lorain clamshell. Write for list of over 1000 power applications.



### DETROIT Diesel

Engine Division of General Motors

Regional Offices:

New York, Atlanta, Detroit, Chicago, Dallas, San Francisco

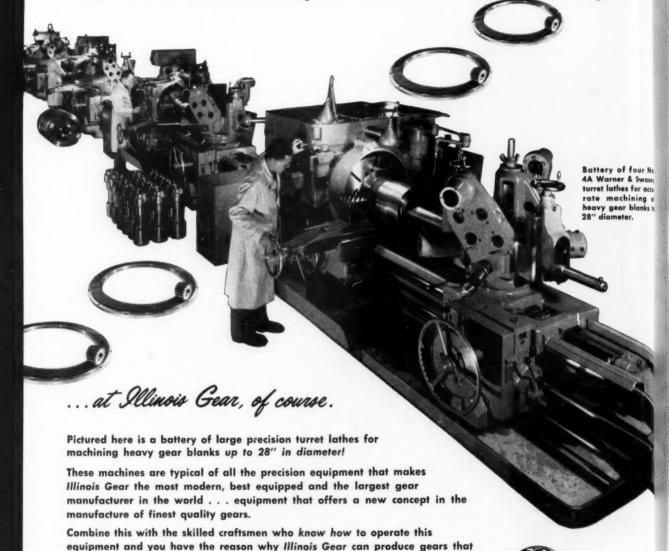
In Canada:

GENERAL MOTORS DIESEL LIMITED, London, Ontario

America's First Choice Diesel Engine

February 1957 — CONSTRUCTION METHODS and Equipment — Page 35

Where on earth will you find such machinery...



measure up to your most demanding specifications . . . why Illinois Gear can

ILLINOIS GEAR CHICAGO

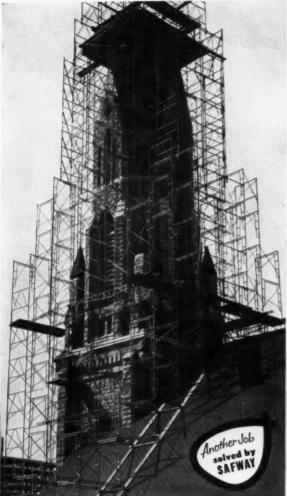
make and fulfill delivery promises.

Look for this mark the symbol on finer gears

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPAN

2108 NORTH NATCHEZ AVENUE . CHICAGO 35, ILLINOIS



Chicago Sun-Times photo

#### SCAFFOLD 'STEPPED IN'

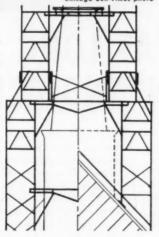
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ining o

This detail drawing shows how standard Safway frames and accessories are used in stepping back the scaffolding to follow the contours of the tapering church steeple.

The base scaffolding is built up partly from the ground and partly from the sloping roof. Swivel base plates adjust automatically to the roof angle. The base towers are spanned with trussed "putlags."

The stepped-back scaffolding is supported on the horizontal putlogs by means of U-shaped saddle pins. Thus frames can be mounted at any points desired.



#### Write FOR FREE BULLETIN

Learn all about Safway scaffolding and the many advantages it can give you. Write today for your copy of the new Bulletin 12. If you don't know where your local Safway office is located, ask us to tell you.

## How to Scaffold a Tall Steeple from a Sloping Surface

#### FRAMES ARE 'STEPPED IN' TO FOLLOW STEEPLE CONTOUR

**SCAFFOLDING** a towering church steeple over a sloping roof is no routine problem. Yet Safway scaffolding service... using standard Safway equipment... offers a safe and easy solution, as demonstrated at St. Joseph's Catholic Church in Chicago.

Planned and erected by Safway's Chicago office, this scaffold helped contractors complete a tricky job on schedule... and profitably. Men and materials quickly moved up to platforms as high as 160 ft. At every level, plenty of elbow room with complete safety resulted in better, faster work.

Swivel base plates permit setting scaffold frames on the sloping roof. At upper levels, scaffolding is stepped inward as the steeple narrows, making it possible to locate workers close to the job—even between pilasters. Trussed "putlogs" span open areas between towers to provide support for upper level scaffolding with maximum efficiency and at lowest cost.

#### SAFWAY SERVICE CAN HELP YOU

Safway scaffolding helps you solve problems—save money on EVERY job! Large or small, difficult or routine, exterior or interior, construction or maintenance—experienced Safway engineers can scaffold your job for complete safety and convenience with economy.

Planning and erection service is offered by 135 Safway offices—including one near you! Ample stocks are available for sale or rental. Learn how you can benefit—get recommendations from Safway on your next job. There is no obligation.

#### Safway Scaffold Advantages

- Safway offers the most complete scaffolding line. Parts for every construction problem are available from stock.
- Safway frames are balanced for easy one-man handling—always important and vital when working in cramped quarters at great heights.
- Safway coupling pins, studs and wing nuts are still the most trouble-free method of assembling scaffolding. For fastest possible erection, Safway Quick-Lock fasteners are also available to permit attaching cross braces with one hand.
- Safway equipment is made from high carbon structural steel tubing...constructed by certified Master Welders...treated with rust inhibitor...finished inside and out in baked enamel.
- Safway originated tubular steel scaffolding . . . offers unequalled experience in its design and application.





**REACHING OUT** over a concrete slab, this American 300 Series Truck Crane sets a steel beam at long radius. Two American 300 Series machines are working on the Seaford

Junior-Senior High School in Seaford, Long Island, N.Y. The Edward G. McDonnell Rigging Company is erecting steel for five new Long Island schools currently under construction.

### PLACING STEEL AT LONG RADIUS WITH PRECISION AND ACCURACY

"For placing steel at long radius with precision and accuracy the American Truck Crane has proved itself to be one of the best machines available!" So says John Doherty, McDonnell rigging superintendent. Working their 25-ton capacity Americans at long radii and with long booms is standard procedure for the Edward G. McDonnell Rigging Company. Setting steel for five Long Island schools, the College Point, N.Y. firm, found the long reaches necessary because of the sprawling design of the buildings. McDonnell rigs its two American Truck Cranes with 110 feet of boom-including a 30-foot jib-then booms way down for maximum reach. A typical situation was encountered when heavy beams were set at an 83-foot radius! Handling the more than 900 tons of steel that will

Cranes." Shelton, a 7-year operator, states that he likes the way an American handles a heavy load. "When the load is heavy and the boom and radius

go into each school are American operators, Leslie

Usher and James Shelton. Usher, 20-year crane veteran

reports the American one of the best steel setting

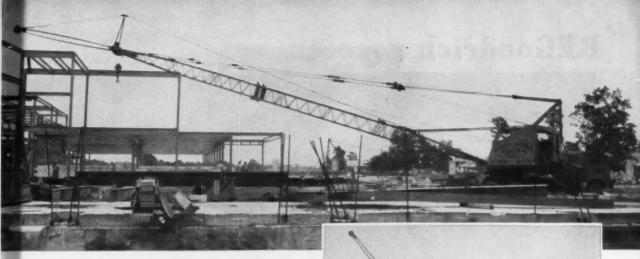
He says, "Smooth is the word for American Truck

machines he has ever operated.

long, give me an American any time," he adds! Get the straight facts about cranes from the men

who know them best-the operators. Ask American operators, like Usher and Shelton, how the machines stack up from their point of view. Then visit your American Distributor to learn the details on a complete line starting at \(\frac{1}{2}\)-yard, \(\frac{12}{2}\) to 15 tons and up!

(Advertisement)



# HOW AUTOMATIC OVERRUNNING SPRAG CLUTCH GIVES AMERICANS SMOOTH BOOM CONTROL

Steel erecting calls for almost continuous booming to pick up (above) and to reach (right). Precise, perfectly smooth boom control at any radius is essential for safety and to speed up the job with spotting accuracy. Here's how American 300 Series Cranes, equipped with automatic overrunning sprag clutches, offer continuous control that eliminates shock loads: When the boom is going up the sprag clutch rides free without power robbing drag. However, in the split second when the boom starts down, the overrunning sprag clutch smoothly, automatically, instantly engages! The result is a positive and direct mechanical linkage between the boom and the crane's engine achieved without even a fraction of an inch of boom drop. With American control you set steel smoothly and safely, even with your longest boom and at maximum radius.

NEW AMERICAN 200 SERIES gives excavating contractors—dirt movers—a versatile <sup>3</sup>4-yard machine designed to handle a variety of fronts on crawlers or rubber. For steel erectors the 200 Series offers a 22½-ton capacity crane. Important features of American's well known 300 and 700 Series cranes have been incorporated into the compact 200 Series. "Big Crane" features that keep production volume up are combined with efficient design to reduce overall operating and maintenance costs. American Distributors have detailed information on the complete American Crane line.

AT AMERICAN HOIST modern foundries and forge shops, well equipped machine and structural shops manufacture precision crane parts under continuous inspection and quality control. A great majority of all crane parts are manufactured by American Hoist. Therefore, every part is checked and rechecked by inspectors through each step of casting, machining and installation. Such close control is not possible when vital parts including gears, shafts, sprockets and castings are bought elsewhere, then merely assembled into a crane. You can be confident of maximum crane safety and trouble-free performance with quality manufactured American Cranes!





#### AMERICAN HOIST

and Derrick Company

St. Paul 1, Minnesota

### **B.F.Goodrich report:**



# Hurricane of sand roars through hose

B. F. Goodrich improvements in rubber brought extra savings

**Problem:** To clean rough spots off metal, the workman is using a blast of sand that roars out of a hose nozzle at terrific speed. Efficient for cleaning, but the hurricane of sand was wearing holes through every kind of hose tried on this job.

What was done: When a B.F. Goodrich man heard about the trouble, he recommended a hose, specially developed by B.F. Goodrich to stand this rough treatment. Extra-soft rubber is used for the lining of this sand blast hose, so the sharp, destructive sand simply bounces off the rubber instead

of digging in and cutting it to shreds. Savings: The B.F.Goodrich hose has been on this job 3 years now—longer than any hose used before—and it shows no sign of wearing out.

Extra benefits: It is much lighter than sand blast hose used to be, more flexible, easier for workmen to handle. And there's no danger of workmen being shocked or jolted by static electricity, generated by sand rushing through the hose. Antistatic rubber carries away electric charges as fast as they build up.

Where to buy: Your B.F. Goodrich

distributor has exact specifications for the B.F.Goodrich hose used in this sand-blasting job. And, as a factorytrained specialist in rubber products, he can answer your questions about all the rubber products B.F.Goodrich makes for industry. B.F.Goodrich Industrial Products Co., Dept. M-866, Akron 18, Ohio.



INDUSTRIAL PRODUCTS

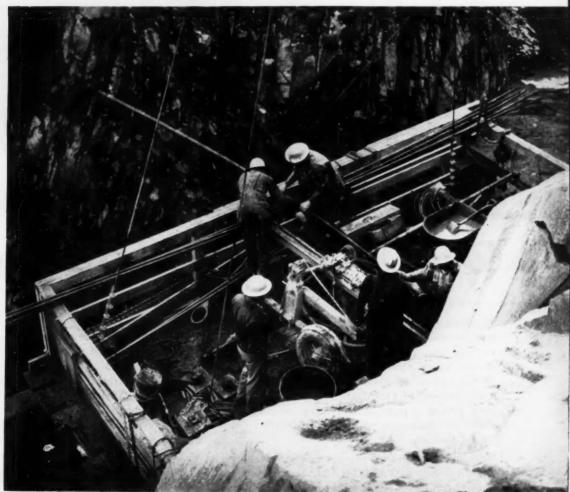
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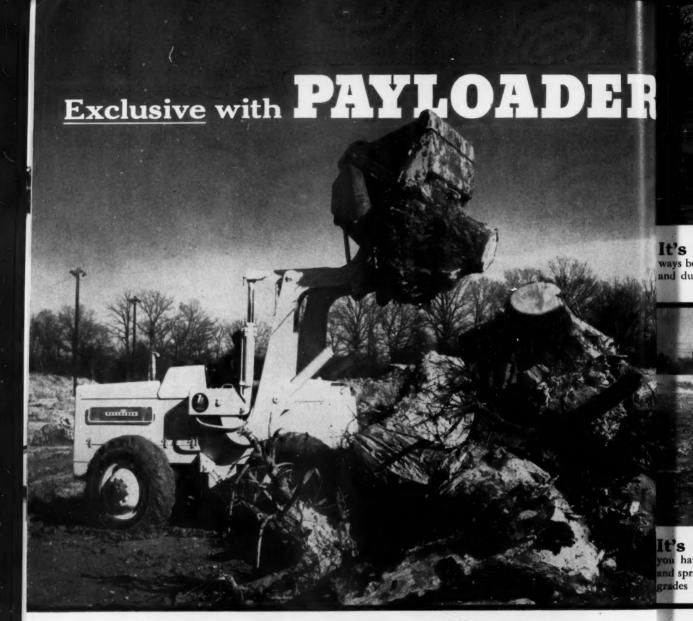


#### Drill Crew Hangs in Air

• Crew drills into a steep cliff above the Cowlitz River in Washington (left) to place rock anchor bolts 30 ft long (below). Arundel Corp. and L. E. Dixon Co., joint contractors for the \$37.1 million Mayfield Dam, installed 21 of the 1½-in. dia bolts to help prevent rock slides and to safeguard men working on the cliff during construction of the dam. Bolts were manufactured by Bethlehem Pacific Coast Steel Corp. Drill is an Ingersoll-Rand wagon drill.



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### DROTT 4-in-1 bucketsh

The Frank G. Hough Co. is pleased to announce that another valuable attachment has been added to those available exclusively for "PAYLOADER" tractorshovels. This is the Drott 4-in-1 bucket which, coupled with the power and mobility of the current line of 4-wheel-drive "PAYLOADER" tractor-shovels, gives them greater performance on many jobs, and the ability to handle many operations that usually require special machines.

More than ever before, you get more tractor-shovel when you buy a "PAYLOADER", because you get more tractor-shovel performance and more versatility. They have power-transfer differentials — an exclusive "PAYLOADER" feature that maintains effective traction on mud, gravel, ice and snow. They have no-stop power-shift transmissions and torque converters . . . planetary final drives . . . power steering and 4 wheel power brakes. They have the exclusive bucket motion with 40° tip-back and powerful pry-out action that enables them to dig more, carry more and deliver more . . . to outperform any comparable tractor-shovels.

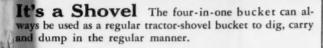
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Your "PAYLOADER" Distributor is anxious to demonstrate what these "PAYLOADER" tractor-shovels and Drott 4-in-one buckets can do for you.







It's a Clamshell Use the powerful clamshell action to clean up small piles, to pick up without tractor travel, to grasp and handle stumps, pipe and timbers fast.



It's a Scraper With slight clam lip opening ou have a carry-all scraper that heap-loads itself, carries spreads thin layers or dumps completely. Strips sod and grades with real accuracy.



It's a Bulldozer Open the clam lip full, and you have a sturdy bulldozer with hydraulic finger-tip bladepitch control to regulate dozing depth and to discharge sticky material.

### shelp you handle more jobs

#### OTHER USEFUL ATTACHMENTS

Hydraulic Back-hoes Crane Hooks Fork Lifts Pusher Plates

Winches Log and Lumber Grapples

Land-clearing Rakes Scarifier Teeth Special Buckets Pick-up Street Sweepers Rotary Snow Plows "V" and Blade Plows

The knowledge and experience gained in 35 years, building thousands of tractorshovels — more than all others combined — is your assurance of superior design, engineering and value when you invest in a "PAYLOADER" tractor-shovel.



Sive

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YLOADER

THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.



THE FRANK G. HOUGH CO. 706 Sunnyside Ave., Libertyville, III.

Send full data on 4-wheel-drive "PAYLOADER" models with Drott 4-in-1 Buckets as checked:

- ☐ model HO 2 1/4 yd. ☐ model HH 1 1/2 yd.

model HU 1 yd. Name

Title

Company

Street City

State

33

# LOOK! NEW FORIT

The boldly modern styling you see in new Ford trucks for '57 only *hints* at how deep-down modern they really are!

These deep-down modern Fords bring you important new advances in power, more durable frames, stronger axles and springs, and completely new stronger cabs with structural design improvements.

'57 Ford trucks are so modern... so new you've just got to see what they can do. Get in touch with your Ford Dealer now.



They're modern through and through

NEW cabs—completely new—stronger, roomier, smarter! New wider full-wrap windshield. New inboard cab step, new Hi-Dri ventilation, new easy-to-read instrument panel!

**NEW hydraulic clutch,** standard in all models from pickups to tandems. Easier to operate—works like hydraulic brakes. Clutch and brake pedals are suspended type for extra driving ease!

**NEW Styleside pickup bodies**, standard at no extra cost. America's biggest pickup bodies! Built wider with all-steel rugged box-section corner reinforcements and recessed taillights. Side loading's far easier with full-width body.

**NEW** riding comfort! A completely new suspension, big roomy cabs with increased visibility, greatly improved riding and handling ease.

NEW chassis and body strength! New frames, up to 13% stronger. New sturdier axles! New higher capacity springs! New stronger, more durable cabs.

**NEW power advances!** New higher horsepower, new freer breathing, new higher compression, new Super-Filter air cleaner. New advancements from camshafts to carburetors! Modern Short Stroke design in every engine—V-8 or Six.



# TRUCKS Ar'57

New T-800 Tandem, 45,000-lb. GVW. High torque 212-hp V-8 engine, 4-barrel carburetor and power steering, standard at no extra cost.

> New F-100 pickup with Styleside body standard at no extra cost. Half-ton models are available in either 61/2- or 8-foot body lengths.

New F-600 2-tonner has higher horsepower and more

rugged chassis construction. More payload capacity than any other 2-tonner.

For '57 and the years ahead -

#### FORD TRUCKS COST LESS

... LESS TO OWN ... LESS TO RUN ... LAST LONGER, TOO!

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# 10 LEADS TO BETTER, and BIGGER FASTER RESULTS PROFITS!



MACADAM DENSIFICATION. The Jackson Multiple Compactor consolidates granular soil subbases and base courses of sand, gravel, rock or slag in half the time required with equipment of



PAVEMENT WIDENING. The Multiple Compactor can be quickly converted to provide in ONE PASS 100% of required density in granular soil sub-bases and rock courses in any widening project.



GRANULAR SOIL FILLS. The Multiple Compactor quickly achieves specified density, gen-into places bigger, more expensive equipment cannot reach. Individual units can be detached operated as manually guided compactors.



SOIL COMPACTION. Self-propelling, the JACKSON COMPACTOR, with 12" to 26" inter-changeable bases, achieves specified density of granular soils in 8" to 10" depths at 2000 sq. ft. per hr. Perfect for bridge and pipe line fills, concrete floor sub-bases, etc.



BLACKTOP WIDENING & PATCHING. The same machine operated from power plant on auto-trailer with pickup for Compactor is most efficient means of blacktop pavement patching, paving walks, drives, etc. Will compact up to 2000 sq. ft. per hr. close to maximum density.



TWIN-UNITS - ONE OPERATOR. With a two-unit, side-by-side or tandem hookup of JACKSON COMPACTORS, one man can readily do the work of two, since the compactors are self-propelling and he has only to guide them.



INTERNAL TYPE; super-powered, gives full width internal vibration through full depth of very thick slabs. Saves time, cement; provides greater



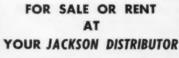
CONCRETE VIBRATION FOR HIGHWAY AND AIRPORT PAVING



SURFACE TYPE; does perfect job of vibrating all mixes in depths used on highway projects. The owder of a JACKSON Paving Tube can quickly switch from internal to external vibration, or vice versa, at minimum expense.



MUNICIPAL PAVING: This vibratory screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around ob-structions, is rolled back for second passes on 4 rollers. Most productive and convenient screed



density and compressive strength.



LUDINGTON, MICHIGAN



#### GENERAL CONSTRUCTION

(Left); 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 21/2 H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

#### Construction News in Pictures . . .



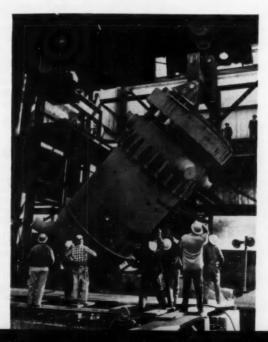
#### Stone Curtain Wall

New Pennsylvania state office building in Harrisburg is enclosed by thin curtain walls of limestone backed with cellular glass insulation. The 4 in. thick slabs of Indiana limestone are carried on a steel angle at the base and held by steel anchors at the top. After a slab is hung, it is parged with a cement mixture, blocks of 2-in. Foamglas insulation are placed with mastic, and the joints are sealed.



#### Barge Slip

Bernard and Byrd of Mobile, Ala., began construction of this barge slip for Olin Mathieson Chemical Corp. on the Tombigee River at McIntosh, Ala., by driving wood mooring piles and steel sheet piling at the leveled site. Then they dredged out the material within the piling. The contractor chose this method to prevent cave-ins of loose sand and gravel in underlying soils.



#### Atomic Lift

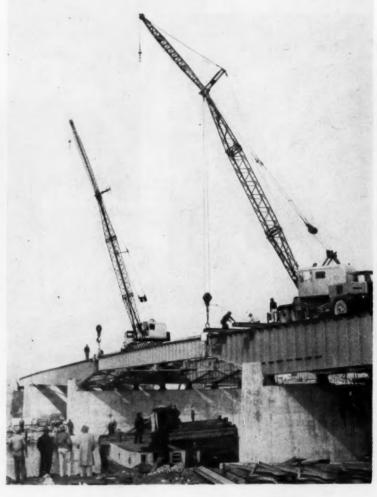
Overhead crane hoists 153-ton atomic reactor vessel from flat car and moves it to a point directly above its final position in Duquesne Light Co.'s atomic power plant at Shippingport, Pa. There it was rigged to a suspension system that held it until insulating walls were installed and it could be lowered to its permanent supports. Dravo Corp., Pittsburgh, made the installation.

continued on next page



#### Strapped Form

Workmen lower a wood column form braced with steel strapping over column reinforcing. When collars are in place and the form is plumbed, the contractor is ready for the pour. Seth E. Giem & Associates of Memphis, Tenn., say the Signode steel strapping is a money saver in forming for column construction at the \$1.3 million Bronson Hospital Nurses Home in Kalamazoo, Mich.



#### Thruway Link

Two 30-ton Lorain Moto-Cranes with 50-ft booms hoist a 110-ft, 30-ton girder from a barge and set it in place for the New York State Thruway's River Road Bridge over the Erie Barge Canal, between Tonawanda and North Tonawanda, N.Y. Kenmore Contracting Co. and Ernst Construction Corp., both of Buffalo, N.Y., each own one of the cranes.



Laufenberg Brothers use a steel caisson to help place uprights for temporary retaining walls around the site for the underground exhibit hall in San Francisco's Civic Center. They drill down 10 ft, drive in the 12-ft caisson, fill it with drilling mud, and then drill to 40 ft. The caisson and the column of drilling mud form a shaft in which uprights can be installed.



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#### BID LOW with help like this . . .

- MOST POWER PER YARD . . . most power per pound in its class
- MOVES FULL LOADS AT FULL SPEED
- WIDE OVERLAP IN GEAR RANGES...for easy shifting, smooth acceleration
- CURVED BOWL BOTTOM . . . offset cutting edge . . . for fast, full loading
- HIGH APRON LIFT . . . positive, clean ejection

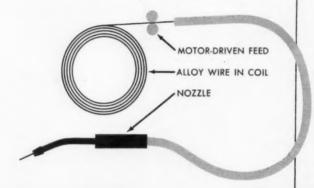
This is the Allis-Chalmers TS-360... a motor scraper that has proved it can help you handle big, tough jobs on rubber... profitably. As bidding gets tougher, be ready with the best... TS-360's. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

**ALLIS-CHALMERS** 

Engineering in Action

# WHAT IS **SEMI-AUTOMATIC** HARD-FACING?

Here is one of industry's newest maintenance tools used to radically reduce hard-facing costs. It is simple, highly versatile and can be installed at moderate price.



Semi-automatic hard-facing is a process which combines the high deposit rates automatic welding with the positioning and setup convenience of the manual method It utilizes a complete series of Stoody fab ricated tubular wires containing alloys that meet all hard-facing requirements. These wires, supplied in layer wound coils, an mechanically fed to the nozzle by the semi automatic welding machine. The weldo merely directs the arc as the metal deposited on the work, the machine auto matically starting the wire feed when the arc is struck, stopping it when the arc broken. Numerous advantages result when rebuilding and maintaining equipment is all types of heavy industry.

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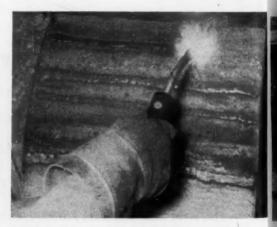
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Repointer welded on with Stoody Nickel Manganese and entire tooth hard-faced with Stoody 121



Roll brought up to size with Stoody Nickel Manganese and corrugations rebuilt with Stoody 100

HIGH WELDING SPEEDS—Two to four times faster than the manual method at correct welding amperages, semi-automatic hard-facing effects enormous savings in time. Penetration of the base metal and dilution of the deposit are reduced, with lower heat input, all highly desirable features of this process.

FULL VISIBILITY—No submerging flux is required; the weldor enjoys complete visibility of the weld at all times. Flux dams are unnecessary.

NO STUB END LOSSES—Wires are supplied in oces continuous coils. There is no stub end waste nor time lost in changing electrodes.

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g and SEMI-AUTOMATIC MACHINES—Now supplied by thod a number of manufacturers, all can be used satfab isfactorily with Stoody semi-automatic wires with minor conversions consisting of wire guides, nozzle and nozzle tip. Conversion kits are available from all Stoody distributors.

WHERE CAN SEMI-AUTOMATIC HARD-FACING BE **ECONOMICALLY USED?**—In general, almost any work now hard-faced manually can be completed faster and cheaper semi-automatically with deposits having wear resistance usually superior to manual electrodes of similar analysis. The illustrations are typical of current semi-automatic applications.

Write for circular. Contains a full description of present Stoody semi-automatic wires and typical applications. Available from your Stoody dealer. Check the "Yellow Pages" of your phone book or write direct.



Dredge pump casing hard-faced with a combination of Stoody 121 and Stoody 100



Shovel track pads rebuilt with Stoody Nickel



Mill hammers brought up to size with Stoody Nickel Manganese, using copper form, then hard-faced with Stoody 100



Tool joints hard-faced with Stoody 130 or Stoody 100

#### STOODY COMPANY

11972 EAST SLAUSON AVENUE WHITTIER, CALIFORNIA

#### Construction 'Round the World . . .

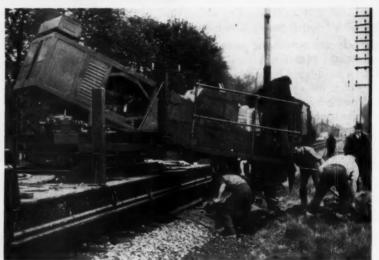


#### In Italy

Already Rome has begun to build for the 1960 Olympics. The "Palazetto dello Sport" (Little Sport Palace) will be the arena in which boxers and fencers compete at the Rome Olympics. It is a circular structure built up of prefabricated reinforced concrete sections. Outside diameter is 240 ft. The spherical roof will rise to a height of about 60 ft.

#### In England

A construction train made up of three separate units speeds the job of setting poles for overhead electrification of a railroad. An earth auger bores holes, an erection unit sets poles in place, and a concreting unit finishes the job. All units are mounted on railroad cars. British Insulated Callender's Construction Co. of London is the contractor.



#### In Columbia

Reinforced concrete arches that intersect under the roof at an angle of 90 deg form the frame of a new church at Medellin. The structure is supported at the two ends and at 12 intermediate foundation points—six on each side—that are articulated to compensate for expansion and contraction due to the extremes of temperature normal for Medellin.

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For the tough job of fabricating the steel framework of the Recreation Bowling Center of Houston, Texas, Southern Steel Erectors uses General Electric engine-driven welders. Low maintenance features impress company owner, Mr. R. O. Matthews.

# Contractor picks General Electric welders for his tough outdoor construction jobs

Southern Steel Erectors, a Houston, Texas contractor, demands welding equipment that is tough enough to withstand the punishment found in outdoor steel framework construction.

No wonder, then, that R. O. Matthews, owner of the firm, now specifies General Electric engine-driven welders for his welding jobs.

He finds that with General Electric equipment, repairs no longer cause cost-consuming downtime for his company. Some of the reasons for this are:

- Extra-heavy-gage metal construction minimizes accidental damage.
- No exciter is required. A potential trouble spot is eliminated.
- Constant-pressure brush springs and pre-set brush holders require no adjustment—are factory set.

- Pre-lubricated bearings all but eliminate bearing maintenance.
- Steel driving disk holds generator exactly in line with engine shaft—has no expendable parts.



Weldor E. D. Keck says that during his 15 years as a weldor, using nearly every make of equipment, he has found the new General Electric engine-driven welders are the easiest to use and produce the best welds.

Mr. Matthews also says, "This G-E engine-drive has more power than other welders, and we save on fuel, too. We use only one gallon of gas per hour. Also, I like its adaptability to a wide range of rod sizes."

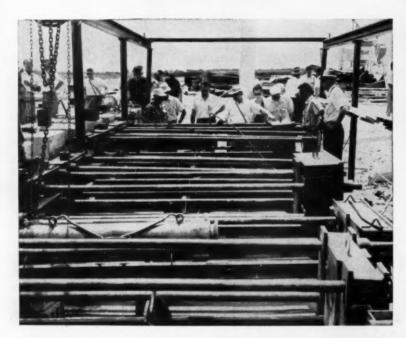
Weldor E. D. Keck says, "I've found in my 15 years as a weldor that the new G-E engine drive gives you a better weld—easier, because there is no fluctuation. All you do is set the machine and it will remain true and constant."

General Electric's new line includes three sturdy ratings, 200, 300, and 400 amperes. For more information contact your nearest General Electric Welding Distributor, listed in the yellow pages of the telephone book. Or, write section 714-6, General Electric Company. Schenetady, New York.

Don't miss the General Electric display at the AWS Welding show April 9-11 at Convention Hall in Philadelphia. The display will be in booth No. 322.

GENERAL ( ELECTRIC

# This Amazing Prestressed Concrete Industry



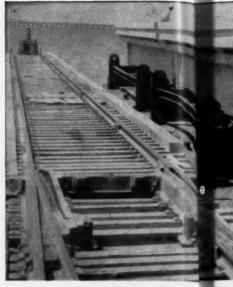
#### What Is Behind Its Phenomenal Growth?

This is a question which has been asked many times. Union Wire Rope Corporation has answered with the sound reasons for venturing a huge capital investment in expanded facilities and in research to master the technical know-how of producing prestressed, stress relieved, high tensile wire and strand. Without this key element prestressed concrete would still not be possible and practical.

To check our own reasons and to develop all of the fundamental facts responsible for the spreading use and acceptance of prestressed concrete,

We Asked A PANEL OF PIONEERS In the Prefabrication of Prestressed Concrete Members To Summarize the Facts Which Has Enabled Them To Maintain a Yearly Growth of 200 to 300 Percent.

What follows is straight from the horse's mouth. It is a summary of the fundamental facts contributed by a sizeable group of prestressed fabricators and consultants. All are pioneers who have had a part in the development of prestressed concrete and experienced its growth from a trickle five years ago to become the building material to be reckoned with by every factor in the building industry.



#### Here Is a List of Prestressed Products Which A PANEL OF PIONEERS Are Prefabricating

Girders

**Roof Slabs** 

Regular, Lightweight, Lift, Channel, Thin shell, Hollow centers, Composite.

Beams Joists Trusses Columns

Piles and Caps
Foundation, Marine, Fender

Lintels Wall Panels Siding Posts

Pavements Highway, Airport

Stadium Framing, Seats

> "Future Applications of Prestressed Concrete Beyond Prediction"

These are the words of one and the consensus of opinion of others on our panel of pioneers. Other prestressed concrete products mentioned as either being prefabricated or tested and proposed are:

or tested and proposed are;
Missile Wings Arches
Barges Skews
Transmission Spring Board—For
Line Supports Off-shore Drilling
Seawalls Piles
Wharfs Platforms

While some of these may seem novel, many will become commonplace. Prestressing concrete for barges, for example, could very well become an industry in itself as is the prefabricating of bridge members.



#### **PANEL OF PIONEER Prefabricators Cite These Outstanding** Prestressed Concrete Advantages...

#### **Fully Utilizes Two Inherent** Strength Factors

Prestressing combines and enhances the inherent characteristics of two of the foremost construction materials—

A. The compression strength of concrete with
The high tensile strength of stress re-

lieved cold drawn steel wire and strand.

#### **Basic Economy**

A. Steel for prestressing is six times stronger than ordinary steel but only approximately 3 times more costly.

B. Concrete for prestressing is twice as strong but only 10 to 20% more costly the strong but only 20 to 20% more costly

than ordinary concrete.

Prestressing consumes less steel and concrete to attain equal or greater structural strength more economically.

#### 3. Structural Balance

A. In prestressed concrete, stresses and strains are balanced to produce structures whose deflections are under definite control.

B. Cracks, otherwise unavoidable in con-

crete, are eliminated by prestressing.

#### **Design Economy**

Prestressed concrete makes possible thinner sections, lower depth to span ratios, longer cantilevering without ratios, longer cantilevering without ballast beams and reduction in weight. All of these factors enable the designer to effect savings in foundation, in columns, in wall height or to convert head room into usable cubage.

nead room into usable cubage.

Steady progress in standardization of sections under the auspices of the Prestressed Concrete Institute is making prestressed concrete more and more versatile from the standpoint of deconcern signers.

#### **Prestressing Is Pre-Testing**

A. Because they are subjected to greater in fabrication than is imposed upon them in the field, precast, pre-stressed members are in reality pretested.

B. Produced by factory methods, under closely controlled conditions, pre-stressed concrete guarantees the de-signer structural performance to meet or better expectations and affords re-lief from extensive supervision and innections

#### Stock Pile Availability

A. Factory line production methods with

time saving devices insures delivery of prestressed concrete members from the production line in step with contractors work schedules.

B. Production of prestressed sections proceeds at top speed, affording maximum utilization of labor and stockpiling against projected construction.

Prestressed concrete eliminates con-struction delays by by-passing materials in short supply or on extended backlog delivery.

#### Speeds Up Construction

A. Construction by the older, conventional methods involves both erection and fabrication on the job site.

The latter is accomplished much faster in central plants or on the site mechanized plants and the resulting pre-fabricated units are erected with clock-

like precision.

C. Often it is possible to complete structures in half the time required by conventional methods. It is often possible to erect prestressed concrete in the time required to make, place and shore up forms for poured in place concrete.

Permanence of Concrete—Plus

A. Well known is the durability of con-crete. Well known too is its vulner-ability to cracking. Cracks lay it and its reinforcing open to deterioration.

B. Prestressing makes concrete a flex-ible material with the ability to withstand extraordinary deflection and recover without cracking.

#### Insurance Savings

Comparison of insurance premiums are

reported on new buildings with pre-stressed concrete roofs as against old buildings with wood roofs. Roughly the yearly premium on the latter is more than for 5 years on buildings with prestressed roofs. Though this is a comparison of extremes, it is indicative of how prestressed construction is regarded by insurance companies

#### 10. Economy of Maintenance

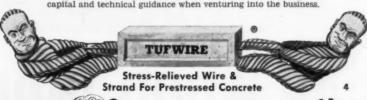
A. Even in marine construction or in con-struction subjected to other extreme corrosive conditions, the cost of maintenance on prestressed concrete construction ranges from nil to the ex-pense involved in painting in cases where color is desired.

#### 11. Widely Competitive

A. The initial cost of prestressed concrete is such as to enable its prefabricators to successfully bid against the permanent, fire resistant, all-weather types construction in many types structures.

B. When the collateral economies effected by prestressed concrete, such as greater and more flexible strength for longer spans and fewer columns, balanced stresses and strains and con-trolled deflection, thinner sections, lower depth to span ratios, lower wall heights and increased usable cubage, ready availability, speedier erection, negligible maintenance and lower insurance premiums are considered, then the competitive edge is definitely on the side of prestressed concrete for a growing list of structures.

So goes the summary of the thoughts of a panel of pioneers except for a warning which was sounded: Be sure of adequate capital and technical guidance when venturing into the business.



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# on today's big jobs



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MATTOON, III.; RICHMOND, CALIF.



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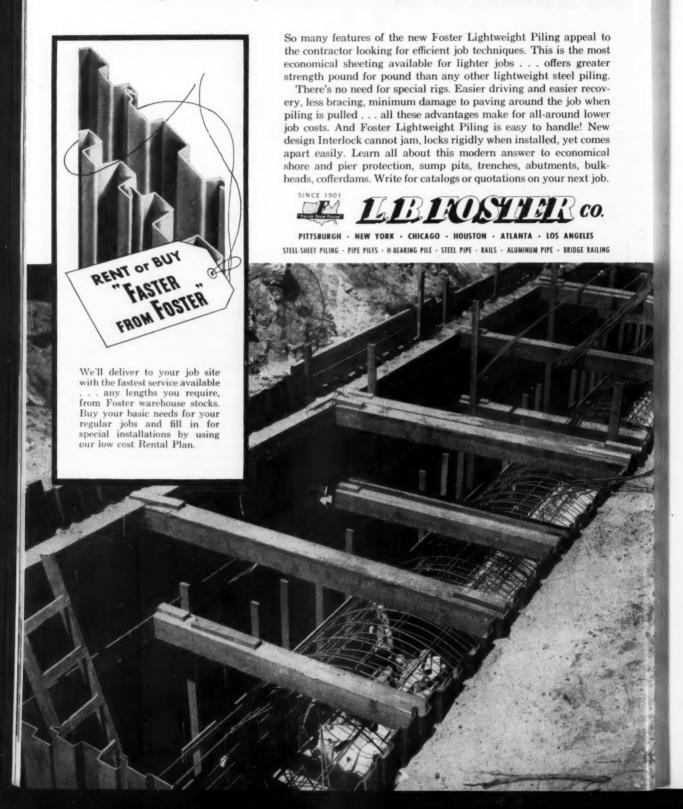
Gar Wood ¾-yard excavators pay off in many "high-output" features. Positive, independent chain crowd on the 75B puts full engine power into every bite. Independent travel means operator can hoist or swing while moving. Dependable production is insured by heavy-duty conical-hook double rollers and flame-hardened gears and shafts.



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# Construction Methods AND EQUIPMENT

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HENRY T. PEREZ, Editor

#### But Where's the Money?

PROBABLY CLOSE to 60,000 visitors with a stake in the construction industry trooped through Chicago's International Amphitheater to see the Road Show sponsored by the Construction Industry Manufacturers Association and the American Road Builders' Association. It was a great show. On display were new and improved models of the machinery that has enabled the United States contractor to outproduce all others. And the exhibit was also another indication—and a mighty one—of the ingenuity in design and competence in manufacture that has characterized our machinery building industry.

The contractor-visitor was impressed. It was easy for him to see that the trends described last month in our staff report, "Tools of the Roadbuilder," are continuing. Machines were larger and more powerful. At the same time there was also an increase in the number of machines in the medium and small size ranges. And many of the machines on display had been made more mobile, more versatile, or more easily operated and serviced than their earlier counterparts.

All these features appealed to contractors. Many orders were booked—in some instances causing an almost immediate upward revision of factory production schedules. But there was also one retarding factor that caused many a potential buyer to investigate a machine thoroughly, regard it with approval, yet wistfully shake his head in negation when it came time to make a decision. That factor was money.

If there was one overriding concern of the average contractor at the Road Show, it was how to finance his operations. Not only were the new and improved machines generally more expensive, but so was his borrowed money. And the latter was becoming increasingly difficult to find.

Many contractors were bitter about having to keep too much money tied up in retained percentages and in unpaid final estimates. Lower retainers and faster payment for work performed would go a long way to help the situation, of course. But the problem goes way beyond that.

When calling for bids, why not include items pro-

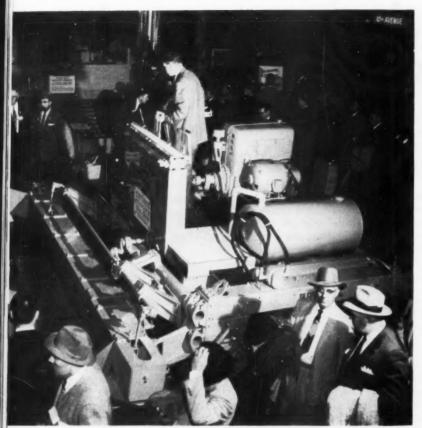
viding for quick reimbursement to the contractor for such things as the cost of moving his equipment on the job, for materials delivered to the site, for setting up his plant. After all, when a job is covered by the contractor's performance bond, the chance of later loss to the owner or awarding body is extremely unlikely. As a matter of fact, some contracts let by the Army's Corps of Engineers do carry somewhat similar provisions. And one recent multi-million-dollar job awared by a private owner includes these enlightened provisions:

The owner makes available 4% of the successful bid price for preliminary financing; the contractor is repaid for his equipment purchases within 30 days (titles transfer to the owner until the contractor pays back the owner, which he must do during the job's last year); the owner assumes the cost of building a construction camp. Perhaps the most unusual provision of the contract is the owner's departure from what has been considered a basic contract must—it waives cash or any other type of surety requirement, and agrees to pay all monthly estimates in full without any form of holdback or retained percentages. There should be more such farsighted owners!

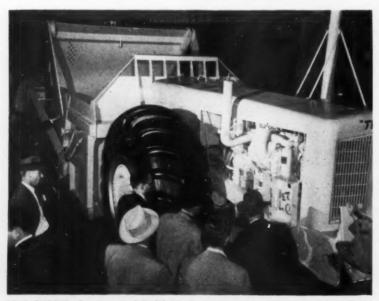
In most instances, reducing the contractor's financing burden also will help cut construction costs, particularly on public works or large private jobs. Here's why:

In his bid, the contractor must include interest on the money with which he is going to finance the job. But, in general, the contractor himself must pay a higher interest rate than does a governmental body or a corporation for whom he builds. If the owner would make money more readily available to the contractor, the former would save the difference in costs of borrowing. This admittedly might be a small point in the overall picture. But with the level of construction activities at a record high and likely to go still higher, these little items of cost add up to a significant total. It is in the interest of the taxpayer, the owner, and the engineer to make these needed adjustments.

### **Crowds View Latest Equipment**



CONTRACTORS swarm over Jaeger exhibit, which featured new finisher with rear screed that swings diagonally, foreground, and Jaeger's new self-propelled stone spreader, rear.



REAR ENGINE of twin-engined Euclid 24-yd scraper gets contractors' attention. Euclid also introduced a new six-wheel, single-engined 24-yd capacity scraper.

THE ROAD SHOW proved to be a virtual Sears Roebuck catalog-inthe-flesh for the thousands of contractors who viewed its amazing display of tools for the roadbuilder.

The equipment exhibited by almost 300 manufacturers wasn't revolutionary in concept, nor was it a collection of drawing-board mock-ups—instead, the show centered around equipment that the contractor will need in the immediate future. While some experimental models were displayed, the overwhelming majority of equipment on view is either now available or will be rolling off production lines shortly.

From the overall point of view, the show's most interesting aspect was the effort manufacturers have made to rapidly and extensively broaden their lines. There are now few types of equipment remaining for which the contractor must depend on only one or two manufacturers. They are filling out their line either by introducing equipment types new to them, or by acquiring other companies who bring new product types to the parent company.

Another trend was the emphasis manufacturers are placing on meeting contractors' demands for versatility. The single purpose machine is almost a rarity. Manufacturers have also met contractors' demands for equipment that is easier to service and maintain. Major component parts designed as units that can be lifted out and replaced quickly, sealed-in-oil assemblies, and centralized lube fittings should eliminate many maintenance difficulties.

Almost every manufacturer talked about the ease with which the new equipment can be operated. All along the line—from electronic batch plants, to tractors with hydraulic controls, to shovels with air controls—the operator's job will be an easier one, and he'll perform it better.

These and other points of interest to the equipment buyer will be discussed in this special CM&E report from Chicago, the first onthe-spot story to appear in any monthly magazine. It will be followed in future months, starting in March, with detailed analyses of the equipment that made its bow at the Road Show.





30-TON off-highway truck, first offered by LeTourneau-Westinghouse, features air-suspension system and new body design that cradles

load low. Cab has perforated panel in front for ventilation, canted windshield, and push-button powered seat.

# Haulage Units . . . Three Show Their First Off-Road Trucks

THE BIG NEWS in off-highway hauling units is their increasing availability. Three manufacturers — LeTourneau-Westinghouse, White, and International-Harvester—showed their first production models of off-road rear dump trucks.

Another point of interest was the emphasis manufacturers place on making it easier to use one prime mover with several types of dump bodies and scrapers. They also are rounding out their lines by introducing new interchangeable hauling units.

Euclid introduced two new dump haulers that are interchangeable with scrapers of comparable size and redesigned the hitch of the standard Euclid 13-yd bottom dump hopper so that it can be used with the Euc S-12 overhung scraper tractor. LeTourneau-Westinghouse's redesigned B Tournapull tractor can haul a 35-ton rear dump or a 27-yd scraper. International introduced a new fourwheel prime mover and also showed a new 25-yd bottom dump wagon that features a clamshelltype dump gate with good clearance under the wagon.

The off-highway truck field is following trends that are apparent

in all heavy equipment categories. Turbochargers and improved power trains with torque converters are being employed to drain and channel increased horsepower from big diesel engines. To make the operator's job easier—and more efficient—powered steering, powered brakes, and powered clutches have become standard on most big haulers. LeTourneau - Westinghouse even offers a power seat. Cab visibility and ventilation have re-

ceived a good deal of attention from truck designers, as has the idea of unitized construction of integrated components so that they can be lifted out in one piece quickly for repairs.

A 30-ton off-road hauler featuring a unique air suspension system, an extremely short turning radius, and a new body design marks Le-Tourneau - Westinghouse's entry into the off-highway truck field.

The suspension system, used for the first time on an off-highway truck, incorporates four big pistons as shock absorbers. The truck can't break a spring because there are no springs: it rides on air instead of steel.

continued on next page



HIGH TRAVEL SPEEDS are characteristic of International Harvester's two new off-highway trucks—the 18-ton model 65 Payhauler, above, and the 24-ton model 95 Payhauler.

#### Special Report on the Road Show

#### HAULAGE UNITS . . . continued

Although the truck has 21 in. of ground clearance, a new type of rock body that carries a good part of its load in a deep "V" low and between the wheels gives the truck good stability because the center of gravity is lowered. The truck is powered by a new Cummins turbocharged diesel that produces 375 bhp at 2500 rpm.

White's new Autocar off-highway truck (Jan. CM&E) features a planetary gear drive rear axle that is fitted with a variety of ratios suited especially for off-highway operations.

The new vehicle, called the Autocar AP-15, is the first in a series of off-highway White units. The AP-15 will haul rated payloads of 15 tons.

International Harvester exhibited its two new off-road trucks, the 18-ton model 65 Payhauler and the beefed up 24-ton model 95. Both trucks feature exceptionally high travel speeds. The big 95 Payloader has a top speed of 37.2 mph with gear drive transmission and 35.2 mph with torque converter. It is powered by a 375-hp Cummins turbocharged diesel.

Euclid's latest rear dump truck is a 40-ton unit powered by twin engines that provide up to 500 hp. Each engine drives its own rear axle through a three-speed Allison Torqmatic Drive.

Euclid also introduced two new rear dumps—the 12-ton model S-7 and the 35-ton model S-18. The S-7, which has a struck capacity of 8 yd, can climb a 26% grade with a full load. A 143-hp engine drives the single-axle tractor through a five speed transmission.

The S-18, rated at 23-yd struck capacity, is powered by a new 300-hp engine with a Root blower. It can turn in 28 ft. Three-stage double-acting hoists, combined with a 60 deg dumping angle, assure fast dumping.

Koehring has brought out a 10-yd heaped capacity version of the popular Dumptor. One of its features is a dual seat arrangement that permits the operator to face his load when dumping or when traveling in reverse. A single set of foot lever controls kick over to face the driver. The new Dumptor carries a 28,000-lb payload.



HOUGH'S BIGGEST Payloader, now ready for on-the-job tests, mounts 4-yd bucket. Size of new rubber-tired tractor-shovels (up to 6-yd) was one of show's biggest surprises.

#### **Rubber Tire Tractors**

A BIG JUMP in rubber-tired tractor-shovel capacities, more turbocharged engine and torque converters, and the introduction of big new four-wheel-drive prime movers and many small industrial wheel tractors are the major developments in the tractor field.

Long the work-horse of any contractor's equipment fleet, the tractor has become one of his most versatile tools. This is due primarily to the introduction of highspeed, rubber-tired tractors that have the weight to give them much better traction than previous units, and to the availability of a large number of integrated attachments that turn the tractor into a valuable excavating, trenching, loading, grading, ripping, or pipe-laying machine, in addition to a push, pull, or dozer unit.

Perhaps the most discussed subject at the Road Show was the size of the new rubber-tired tractor shovels. Clark and Mixermobile now boast 6-yd capacity units, and Hough showed a developmental 4-yd Payloader. Pettibone-Mulliken's biggest Speedall mounts a 3½ yd bucket.

The new king of the Michigan tractor-shovel line, the 6-yd capacity model 375A, is designed to provide low-cost, high-speed loading of 20 to 25-yd hauling units in only four passes (CM&E, DEC,'56) Weighing better than 50,000 lb, it will carry 15,000 lb at 4 mph. Another new Michigan shovel, the 4yd 275A, carries 11,000 lb at 4 mph. Clark also has dozers for the new rubber-tired tractors. The model 280 tractor-dozer weighs 42,000 lb and mounts an 1134-ft blade. The model 380 weighs 62,000 lb and mounts a 131/2-ft blade.

The 6-yd Scoopmobile features four-wheel drive and four-wheel steering, which gives it exceptional maneuverability. Its power plant is a turbocharged Cummins diesel and the power train incorporates a torque converter.

Hough's big Payloader, which has just finished company testing and will now go out for on-the-job testing before it is available, was shown with a 4-yd bucket. Company officials, however, say that new tractors will be fitted with buckets ranging from 3 to 7 yd. The development model on display

#### Tractors . . .



CATERPILLAR shows new four-wheel-drive tractor. With 10-speed transmission top speed is 32.1 mph, rimpull is 34,140-lb.



INTERNATIONAL'S four-wheel prime mover for new scraper, bottom dump, and rock wagon uses components of 95 Payhauler.

#### Get Bigger

was powered by a 250-hp turbocharged diesel.

Tractomotive's TL-20 Tractoloader, a new 2½-yd front-end wheel loader, incorporates a power-shift transmission with a torque converter, planetary drive axle, power steering, and four-wheel brakes. Power for the new loader is provided by an Allis-Chalmers diesel with 344 in. displacement that develops 95½-hp at 2000 rpm.

Caterpillar's newest addition to its line of rubber-tired units is its first four-wheel-drive tractor-the 300-hp No. 668. The new tractor uses the same turbocharged Caterpillar diesel used in the Cat DW20 and DW21 tractors. With a 10speed transmission, the tractor reaches a top speed of 32.1 mph when used as a scraper prime mover. When used as a dozer or pusher, a 10 speed forward, fourspeed reverse transmission gives speeds up to 26.3 mph. With the front wheel drive engaged, the No. 668 has a maximum rimpull of 34,140 lb in first gear.

International's new four-wheel prime mover incorporates basically the same frame and drive train of its new 95 Payhauler off-highway truck. It is designed principally to haul a new scraper, a new 25-yd bottom dump, or a rock wagon that is now in the development stage. International, incidentally, also showed a Drott 4-in-1 on its TD18 crawler.

LeTourneau-Westinghouse unveiled a new 143-hp model D Tournatractor at the show. The new wheel tractor, which will be made available after further on-the-job testing, is described by company officials as a companion piece to

the larger C Tournatractor. The unit incorporates a new planetary steering system that permits turns while maintaining power on all four drive wheels. The steering system takes better advantage of the tractor's push power, adjusts sharpness of turn and forward speed automatically.

Three recent entrants into the small and medium-sized industrial wheel tractor field—Massey-Harris-Ferguson, Minneapolis-Moline, and Case—showed new models and a variety of attachments. The new



HYDRAULIC RIPPER, developed by Gar Wood for Euclid's big TC-12 crawler tractor, has hinged teeth that can swing through 180 deg freely while tractor maneuvers.

#### Special Report on the Road Show

#### TRACTORS . . . continued

small wheel tractors are not converted farm units; they are redesigned from the ground up to give them the strength to handle backhoes and loaders, and other special purpose tools.

Two new Case-Terratrac crawlers, the 80-hp model 800 and the 100-hp model 1000, feature a new counter-rotating transmission that enables the operator to control both speed and direction of each track independently.

The new crawlers, both of which incorporate torque converters as standard, are available with 1½ or 2-yd loaders, with an angling dozer blade, or with a newly-designed straight dozer blade that tips not only fore and aft, but also tilts to either side.

Oliver and Minneapolis-Moline both introduced small sized crawlers. The new Oliver crawler is the 21.8 dbhp OC-4, which features a four-speed transmission and four lower track wheels for additional ground contact.

The Minneapolis-Moline crawler, called the 57-hp Golden Kat, is its first. Expected to be the forerunner of a line of medium-sized units, it features a 206 cu in., valve in head engine with a 7.3:1 compression ratio.

Horsepower on both of the giant crawler tractors, the Euclid TC-12 and the Cat D9, were increased recently. The twin-engined TC-12 now offers 436 hp and a top speed of 8.3 mph.

One of the D9's, which now offer 320 hp at the flywheel with a torque converter, mounted a new dozer with a straight center piece, but with two side section angles forward so that material is pushed inward to cut down end spillage.

Road Show audiences also saw Cat's new dozer-ripper combination mounted on a D7 crawler. Called the Gyro Dozer, the blade has four teeth extending 20 in. in front of the blade cutting edge. To get a good ripping angle, the blade can be tipped both forward and backward, and it can also be tilted 20 deg to either side.

Eimco has developed a  $2\frac{1}{2}$ -yd front end loader for the 105 crawler, which previously mounted its popular over-head loader. The new loader can operate with only  $9\frac{1}{2}$  ft of head room.



LARGEST OF CLARK'S new Michigan scraper line, the 27-yd model 310, draws crowds. Scrapers feature speeds and horsepower ratings that match those of Clark pushers.



DEMONSTRATING TREND toward versatility—evident in most equipment types—Allis-Chalmers Model D grader with rear-mounted loader works on simulated road maintenance job.

#### Scraper Units . . .

#### **Clark Shows Its New Michigan Line**

A GOOD DEAL of Road Show talk concerned the introduction of a Michigan scraper line—with capacities ranging from 10½ to 27 yds—by the Clark Equipment Co. As with other scraper manufacturers the over-all trend was toward lower and wider bowls.

One of Clark's big selling points is its standardization of power train components. Clark scraper and dozer tractors of comparable capacities utilize the same power shift transmissions, torque converters, and planetary wheel axles, as well as the same engines. In addi-

tion to providing matched horsepower and matched speeds between scrapers and pushers, this principle of standardization of components in various machine types enables a contractor to cut down on his spare parts inventory. Another important advantage is that the contractor's shop people become familiar with, the same basic power units.

The three new Michigan scrapers are the 10½-yd heaped capacity model 110, the 18-yd model 210, and the 27-yd model 310. Engines are 165, 240, and 375 hp, respec-

tively. Besides Clark's integrated power train, the scrapers feature top speeds of over 30 mph, fully hydraulic scraper controls, and

low centers of gravity.

LeTourneau-Westinghouse has re-designed its B Tournapull and included about "50 under-the-skin" improvements over the previous model, according to company officials. The unit combines a restyled prime mover with a bigger Fullpak scraper. Improvements in the prime mover include a new 16-in. double-plate clutch with air-assist power and a heavier final-drive shaft. The new 27-yd scraper features a longer blade and a broader and longer bowl interior.

Two new 24-yd struck capacity scrapers head the group of Euclid's new products. The Twin-Power, all-wheel drive TS-24 model is equipped with two engines (518 total hp), each driving an axle through a separate Allison Torqmatic drive. As on all other Euclid scrapers, hydraulic action controls all bowl operations. The unit

weighs 80,000 lb.

The other new 24-yd scraper is the single-engined, six-wheel SS-24 which can carry heaped loads of up to 34 tons. The SS-24 features the largest planetary drive axle Euclid has ever used on a scraper and it takes a 300-hp GM or a 335 Cummins diesel. Euclid also has replaced its 15.5-yd scraper with the SS-18, which has a 60,-000-lb payload capacity.

Oliver's self-propelled scraper, the first it has offered, is designed for two purposes: to serve as a clean-up rig on big jobs and to provide a small unit in the price range suitable for the smaller contractor who handles a variety of jobs. The Oliver scraper is a 6.7-yd unit powered by a 83.4-hp GM die-

sel.

In line with the trend toward interchangeability, Caterpillar is developing a new scraper hitch that will permit switching the 18-yd Cat No. 456 scraper from a wheel tractor to a crawler tractor in a matter of minutes.

Of major interest was a new ESCO scraper cutting edge. Called the ArcEdge it features a curved design that provides extra metal at the cutting edge. This extra metal forms a backbone that supports the cutting edge and resists abrasive wear.



KOEHRING model shows trend toward bigger capacity truck cranes. The 45-ton crane can handle a 120-ft boom plus a 30-ft jib. The road speed is 31.8 mph.

#### Shovels and Cranes . . .

#### Excavators Feature Better Controls; Truck-Mounted Cranes Get Bigger

SIMPLIFIED power control systems, bigger truck cranes, and a greater variety of front-end attachments for smaller machines were highlighted at the impressive crane and shovel exhibit.

A mock-up of Thew-Lorain's "Joy-Stick" control system, which uses only two air-powered levers to control all turntable friction clutches, was on view. For single operations, the operator moves them back and forth or side to side at any speed, and to combine operations he simply moves them diagonally.

Link Belt demonstrated its hydraulic Speed - O - Matic control system, which is now standard on all its machines. Besides making things easier for the operator, one of its main advantages is that it cuts down on maintenance because it incorporates a minimum of wearable parts.

The trend toward bigger truck cranes was apparent. Koehring now produces a 45-ton model that can travel over the highways at 31.8 mph, and Harnischfeger introduced a four-axle, 40-ton model. Thew introduced a heavier carrier for its 35-ton model MC530W truck crane, and Link-Belt showed its 30-ton model HC-98 mounted on

a new, heavier four-axle carrier.

Several self-propelled truck cranes were also on view. Shield Bantam showed their T-35, which features an extremely short turning radius, and nine fast-change attachments. A new Lorain self-propelled crane offers four-wheel steering that enables it to crab sideways.

In the crawler field, Lima unveiled a 3-yd model with a 28-ft boom and 22-ft stick. A crane version that can swing a 200-ft boom and 45-ft jib is also available. For haulage, it can be knocked down into segments weighing less than 60,000 lb each.

Koehring filled out its line with a new 2-yd shovel, the model 805, which takes a 25-ft boom and 18½-ft stick. Bucyrus-Erie's latest machine is their 1-yd 30B shovel. A 35-ton transit crane version is also available.

Quick-Way introduced both a crawler-mounted and truck-mounted 4/10-yd-8½-ton excavator, and a crawler-mounted version of its 5/10-yd shovel. An interesting front-end attachment was a new telescopic-type boom fitted with a bucket that can pivot from side to side and open and close with a wrist-like action.

#### Paving Equipment ...



EFFICIENT VIBRATING SCREED allows Cedarapids bituminous paver to lay up to 102 fpm without tearing mat. Hetherington & Brenner also showed first pavers.

#### **New Bituminous Pavers Bow at Show**

THE BIG NEWS about bituminous pavers is that two manufacturers are now entering that field for the first time. These are the Iowa Mfg. Co., and Hetherington & Berner. Another important development is the speeds with which the new pavers, and redesigned units of manufacturers already in the field, can work. Bigger and more effective screeds have given the pavers work speeds that are limited only by problems of supply or, in some cases, specification restrictions.

The new Cedarapids crawler-mounted paver features an electrically vibrated screed that permits it to work at high speeds without tearing up the asphalt mat. The 24-in. wide, one-piece channel-shaped screed is vibrated at 3600 impulses a min. by four separate vibrators operating through rheostat controls.

A test model of the new Cedarapids paver working on the Kansas Turnpike handled up to 200 tph at times, and reached paving speeds as high as 84 fpm. The paver has actually exceeded 100 fpm during tests, according to com-

pany engineers, without sacrificing density or uniformity.

Hetherington & Berner's new paver, which is still in the experimental stage, according to the company, features simple, fast-acting controls—many electrical—and a vibrating screed to consolidate the bituminous mat. Mounted on four wheels, the machine has a top working speed of 50 fpm. Still undergoing modification, it will be marketed sometime next year.

Blaw-Knox showed its new PF-45 paver, a small version of its PF 90 model.

The latest version of its popular crawler-mounted finisher was displayed by Barber-Greene. The paver embodies several major improvements: A new transmission provides 12 forward speeds and a new high working speed of 64 fpm; The operating speed of the machine's tamper is increased to permit faster laying speeds, and a new power unit that increased horsepower by 20% is also incorporated. Barber-Greene also showed a bituminous paver mounted on rubber, but company officials called it strictly an experimental model.

The Pioneer Vibromatic paver has also been improved. The new model features wider tracks, a new fluid heating system for better distribution, and a chain arrangement that frees the moldboard so that it can be cleaned easily. The paver now offers three different compaction areas: under the heel of the moldboard, under the heel of the oscillating screed, and under the heel of the vibrating screed.

#### **Crushing and Screening**

Improved and larger screens, and the use of wobblers and grizzlies to bypass under - sized materials around crusher units are featured by many crusher manufacturers. These developments will be appreciated by contractors who must work out of pits that run heavy to fines and by those who previously had complained about feed stoppages, clogging, and reduced crusher output.

Universal Engineering Co. displayed a working model of its new wobbler feeder — it feeds and scalps at the same time—teamed up with their model 3654 Impact Master crusher. In operation, the wobbler takes out all 2-in. minus material before it goes to the crusher and deposits it on the conveyor receiving material passed through the crusher.

Cedarapids' new portable primary crushing unit uses a vibrating grizzly as a bypass for materials under crushing size. Its feature is that it reduces the load on the crusher, and permits it to handle

larger capacities.

To round out its line of Cedarapids screens, Iowa Mfg. Co. brought out a new 60-in.x16-ft triple deck vibrating unit. Its horizontal positioning is said to provide as much as 12½% more effective screening area over many inclined screens with comparable lengths.

Barber-Greene introduced a new type screen designed especially to handle wet, sticky materials. Called the Duo-Screen, it is actually two sets of superimposed screens, with one layer of the screen free to move because of a flexible, rubbermounted connection.

Two new Telsmith crushing units, a 42x48-in. jaw crusher and an efficient 5½-ft gyrasphere crusher, were exhibited by Smith Engineering Works.

Significant trends in concrete batch plants appear to be increasing portability for the small and medium-sized plants, and better controls that provide higher batching speeds and better accuracy in the bigger stationary plants.

The Butler Bin Co. showed a new plant, called the TX-4, that grows up with the contractor. The contractor servicing only one paver starts with a basic plant equipped with two batchers, and as the need arises he can add additional batchers to the same bins. According to company officials, the expanded plant has the capacity to service four 34E dual drum pavers. In its expanded version, the plant weighs out sand, cement, and two grades of stone at the same time.

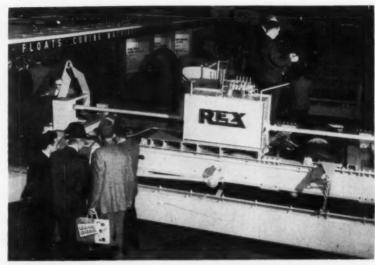
A highly mobile plant with its own built-in wheels on all three components was exhibited by C. S. Johnson Co. Called the Porto-Batcher, the plant is said to have a capacity of from 60 to 100 batches per hr. High-speed conveyors are employed to charge the plant. The plant can be made ready to move from job to job in an extremely short time.

#### **Concrete Paving**

Improved concrete paving equipment, with closely integrated speeds and capacities in the various units that make up a paving spread, were introduced by several manufacturers. Units with frames that can self-widen, either mechanically or through electric or hydraulic controls from the operator's seat, attracted great interest.

Chain-Belt Co. took advantage of the Road Show to display its recently broadened line of machines. With its previous machines, and with the equipment developed by the recently acquired General Roads Machines, Inc., the Rex line is now a complete road building package—from forms to curing machines.

Flexible Road Joint Machine Co. has a new idea that combines floating and finishing operations. It consists of two standard finishing machine frames tied together with 10-in. wide flange beams. All eight wheels are arranged in bogie fashion and allowed to oscillate, thereby minimizing inequities in form elevation. A 32-in. wide float follows two 16-ft wide screeds.



CHAIN BELT now offers complete concrete road building package—from paver to curing machines. Acquisition of General Roads Machinery, Inc., filled out its Rex line.

An all-hydraulic, self-widening finisher with a standard screed in front, but with a rear screed that can swing 26 in. diagonally in either direction, was introduced by Jaeger Machine Co. The diagonal screed can be used to carry material uphill on pitched and elevated curves so that it works solidly against the upper form.

#### **Asphalt Plants**

Trends in asphalt plants include more electrically powered units, one-man operation through electronic or electric controls, faster mixing cycles, and increased portability. Barber-Greene and Cedarapids introduced new, high capacity plants with electronic controls, and the McCarter Iron Works showed a plant with double gates

on bin compartments and a prewired electrical panel mounted integrally on the mixing tower.

White's new plant incorporates a batch-type 1000-lb pug mixer with air-controlled gates. Asphalt heating kettle, reciprocating plate, and aggregate feeder are built-in. A 50-hp engine or a 30-hp electric motor are optional.

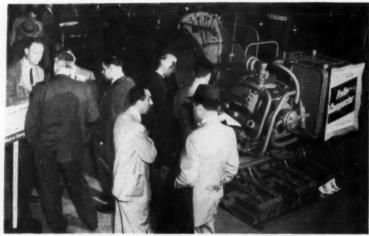
The new Madsen Hot Rod asphalt plants, available in 3,000, 4,000, and 5,000-lb capacities, are capable of producing up to 250 tph of close specification mixes. The plants feature a fully-enclosed gear box reduction unit that goes right to the patented Twin-Shaft pug mill mixer. Air controls operate the asphalt pressure injection system, bin gates, and mixer gates.

continued on next page



FLEX-PLANE combines finishing and floating operations. Two frames are tied together with beams. One has two 16-ft screed; other one has a 32-in, wide float.

#### Compaction . . .



AUSTIN-WESTERN three-wheel roller with three vibrating shoes mounted on rear exemplifies trend toward equipment that combines several types of compacting action.



OPERATOR on new Seaman-Andwall rollers has only one lever that he moves like a joy stick to both steer and accelerate. Bucket seat rotates 360 deg so he can see job.

#### **Compaction Rigs Are More Versatile**

ONE OF THE MOST interesting compaction units on view at the show was a big four-wheel-drive, four-wheel-steer Wagner tractor equipped with segmented steel compaction wheels that are interchangeable with rubber-tired wheels. With a dozer blade mounted on the tractor, the unit can dress a fill and compact it at the same time.

Other trends appear in new units that provide several types of compaction in one vehicle, and in bigger steel roller units with simplified controls and torque converters.

Vibrating units on machines for base compaction seem to be growing popular. Austin-Western showed a three-wheel roller with three vibrating shoes mounted on the rear. The shoes are the same hydraulically driven types used on the Lima Roadpacker. Still in the experimental stage, the rig is said to provide thorough base compac-

tion by combining vibration with steel rollers.

Other combination compactors include a Bros unit with a steel roll on one end and oscillating pneumatic tires on the other and the Seaman Gunnison Duo-Pactor, which can be used as a vibrating roller and oscillating pneumatic-tired unit. In addition, the drive wheel on the tractor can be replaced with sheepsfoot rollers.

The trend in steel-roll compactors is toward simplified, powered controls. Acme Iron Works has introduced a 12-ton Reverse-O-Matic Ingram roller with a drive system that permits no-stop, power-shifted reverse with one lever controlling speed and direction.

Seaman-Andwall displayed two new variable-weight, steel-wheel units that feature exceptionally easy-to-operate hydraulic controls. The operator has only one control lever, and he can move it in any direction to accelerate and steer. There are no brake, clutch, or accelerator pedals.

Huber-Warco three-wheel rollers, making their first public appearance at the show, are equipped with torque converters and two-speed transmissions.

#### **Drill on Crawlers**

THE ROAD SHOW emphasizes the continuing trend toward selfpropelled crawler drills that can work almost anywhere, and haul their own compressor.

Among the new crawler-mounted drills on view were Ingersoll-Rand's Crawl-Ir, Thor's Drillcat, and Worthington's Port-A-Trac.

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The Crawl-Ir is a self-propelled unit with a boom swinging cylinder that permits it to drill in a wide pattern without having to reposition the crawler. The Thor drill has twin, reversible 7½-hp motors that have the power to tow a compressor (Photo, p. 206).

Joy, which introduced a crawlermounted unit last year, has now come up with a new self-propelled 4-in. wagon drill.

Schramm now offers a rotary drill rig built around a self-propelled air compressor: the Rotadrill, which can drill a deep 4½-in. hole, has been mounted on a 125 cfm Pneumatractor.

# More proof that CAT\* LOWBOWL Scrapers deliver bigger, faster loads

Handling tough material on the Florida Turnpike, a new DW21 (Series C) Tractor-No. 470 LOWBOWL Scraper averaged 128 pay yd. an hour on a 6900-foot round trip

#### RESULTS OF FLORIDA TURNPIKE JOB TEST

JOS AND LOCATION: Building 3.8 miles of new road on Florida Turnpike, near Hollywood. The job involves moving about 1,000,000 cu. yd. of sand. The contractor: Troup Bros., Inc., Miami. CONDITIONS: Material—very fine, loose white sand with an estimated shrinkage of 25%, borrow to compacted. Loading—D9 (Series D) Tractor with torque converter used for pusher. Haul distance—3250 feet over loose to damp, compacted sand, maintained by a No. 12 Motor Grader. Rolling resistance, 100 lb./ton. Return distance—3650 feet. Grades on haul—400 feet of 1°-3° adverse and 600 feet of 1°-2.2° adverse.

#### TIME STUDIES

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AVERAGE										L	DW21-No. 470 OWBOWL Scraper	
Load time .											.44 min.	
Haul time .											3.33 min.	
Haul speed .												
Spread and tu	r	1	iln	ne	(1	80	(۰)				.38 min.	
Return time											3.37 min.	
Return speed											12.31 MPH	
Wait time .										9	.39 min.	
Total cycle tir	n									0	7.91 min.	
Trips per hou	r										7.59	
Pay yd./trip		0							0	0	16.8	
Production pa	y	y	1./	h	bu	r		0			128	

REMARKS: The loose, fine sand was difficult material to load. In spite of this, average loading time was excellent, due to the fast-loading characteristics of the new No. 470 LOWBOWL Scraper. Average cycle time was excellent, too—a reflection on the new DW21's Turbocharged power and wide-base tires!



Recent tests on the Florida Turnpike confirm previous reports from other jobs in Iowa, Kansas and New Jersey—the new Caterpillar LOWBOWL Scraper steps up production with bigger, faster loads. Here's proof again that on the job, where results and only results pay off, the new LOWBOWL design delivers a new high in money-making performance.

Says Donald R. Grubbs, Superintendent for Troup Bros., Inc., Miami: "I like the wide-base tires on this new DW21—they help us over this sandy fill. The new LOWBOWL Scraper design also cuts down our loading time. What's more, we've had very little down time with our Caterpillar equipment."

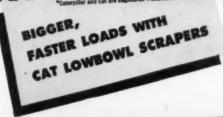
Before you make your next bid, get the full facts about the new LOWBOWL Scrapers. Your Caterpillar Dealer's salesman carries completely documented details about their productive capacity on this and other jobs. Ask him to show them to you!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



The new two-wheel Cat DW21-No. 470 LOWBOWL Scroper. A new four-wheel DW20-No. 456 LOWBOWL Scraper is also available. Both units have a capacity of 25 cu. yd. heaped; 18 cu. yd. struck. Both feature the new Turbocharged, 6-cylinder Cat Engine which delivers 300 HP (maximum output) and 10% more rimpull. New LOWBOWL design loads more material with less resistance clear to the end of the loading cycle. Wide-base tubeless tires, now standard equipment, eliminate an estimated 80% of down time caused by tires.

# CATERPILLAR\*





9:01 A.M. WELLPOINT GENERATOR AT WOODMERE IS REPORTED BURNED.



9:02 A.M. FIELD REPAIRMAN IS ALERTED.

# DOWNTIME'S BEEN CUT AT HENDRICKSON BROS.

THANKS TO RCA 2-WAY RADIO

Whether it's replacing a burned-out pump generator, repairing a tire, or resplicing a cable, the radio-equipped maintenance department of Hendrickson Bros., Inc., Valley Stream, L.I., swings into action FAST! Field repair trucks fitted with replacement parts, tools, and 2-way radio tour the jobs continually. They're in touch with the office at all times and can talk to one another on the road. If it's a shop job that's needed, the equipment can be towed in for prompt repair. "Fast, efficient, effective," is the way they describe their operation with radio.



9:15 A.M. SPARE GENERATOR IS ON THE JOB.

RCA 2-WAY RADIO FOR CONSTRUCTION USE is

specially designed to "take it," with sturdy drawer-type case design, elliptical loud speaker providing 3 times more acoustical power than the ordinary type, greater range and better signal at any distance. Built-in 6-12-volt convertibility. New Improved "Red Head" microphone, transistorized or regular, now available. Mail coupon.

Radio Corporation of America Communications Products Dept. O-203, Building 15-1, Camden, N. J.	
Please send me complete information on RCA 2-Way construction business.	Radio for use in th
<ul> <li>Have RCA Communications Specialist make a FREE operation.</li> </ul>	radio survey of m
Name	
Company	
Address	
CityZone	State

Mark of RCA Quality
RADIO CORPORATION of AMERICA
COMMUNICATIONS PRODUCTS  CAMDEN, N.J.
in Conada: RCA VICTOR Company Umited, Montreal Visit RCA's Booth at the Show I



WITH A SIX-POINT PICKUP, cranes lift a bent from cribbing and turn it from horizontal to vertical position while it is in the air. This

avoids placing any weight on the legs so there is no risk of cracking the member and no need for expensive reinforcing.

## **Truck Cranes Erect Big Bents**

TWO TRUCK CRANES, cleverly rigged and handled, teamed up in a precision performance to erect nine big precast concrete bents for the frame of the new First Presbyterian Church in San Mateo, Calif.

Each of the bents is 58 ft high—among the highest precast bents on record—and weighs up to 40 tons. They are 16 in. thick and range from 16 to 32 in. wide.

A 50-ton American Hoist & Derrick truck crane and a 25-ton Bay City truck crane worked together to lift the big bents from the stacks in which they had been cast, carry them in a horizontal position to the point of erection, and boom them into position.

The 50-ton American is a new rig, one of the most powerful cranes on wheels. The one on this

job was the first in the northern California area, and at San Mateo it was working on its first job.

Bigge Crane & Rigging Co. of Oakland, Calif., with Irv Burrell as supervisor, handled erection of the bents in two stages. The first step was to pick up a bent at the casting bed, move it perhaps as much as 200 ft, and set it on cribbing at continued on page 74



It's the hard work that separates the "men" from the "boys" in construction equipment. Faced with their greatest construction challenge in history—the 41,000-mile Interstate Highway System—contractors must depend on "men" if they are to get the job done profitably, and get it done on time.

Any machine can do a passable job when the

going is easy. But this challenge involves hard work... the kind that tests the ability of equipment to produce. That's the kind of work that made Caterpillar-built machines the leading equipment used by contractors. CAT\* units are designed and built for money-making performance under the toughest conditions. Where the going is roughest, Caterpillar

it.

DI



equipment gets and handles the job. Got some hard work to be done? Give it to the machines that want it, like it and can do it profitably for you-Caterpillarbuilt machines!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

DIESEL ENGINES - TRACTORS - MOTOR GRADERS - EARTHMOVING EQUIPMENT

# CATERPILLAR\* \*Caterpillar and Cet are Registered Trademarks of Caterpillar Tractor Co.

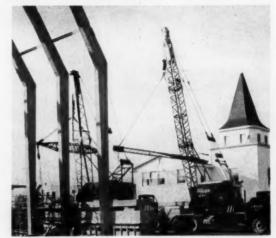
HEAVY-DUTY MACHINES FOR THE HARD WORK

#### It takes 25 minutes . . . ▼



▲ to lay the boom down ... ▼



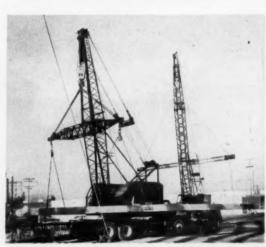


With shortened booms . . . ▼

▲ cranes make the pickup . . .



▲ remove a 40-ft section . . . ▼



▲ move to erection position . . .

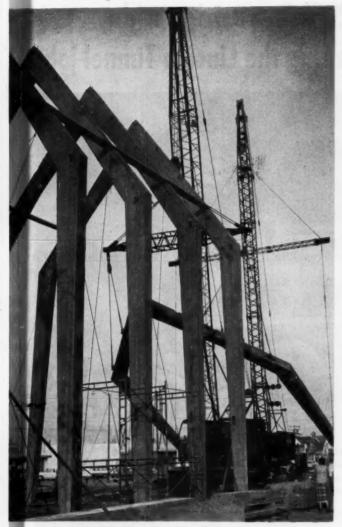


and reconnect the boom tip

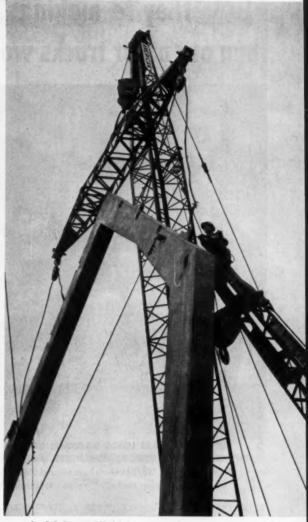


▲ and set a bent on cribbing

#### With long booms . . .



cranes erect a bent and . . .



... hold it until it is guyed

#### **ERECTING BIG BENTS...** continued

the point of erection; the second step was the actual erection.

For the first step, Burrell reasoned that it would be safer to move such heavy loads with short booms. The 80-ft booms with which each of the two cranes were equipped offered more risk of whip action that might cause damage to the concrete pieces or to the cranes.

So Burrell directed his crews to remove a 40-ft section of pin-connected boom from each crane before the moving operating. It took the crews only about 25 min to remove the center section of the boom on each crane and re-connect the boom tip.

For the move, the heavier crane

rode inside the 38-ft wide concrete bent. It was rigged with a 26-ft spreader beam that made possible a four-point pickup from the top of the bent. The lighter crane made a two-point pickup from the base of the bent, acting through a 41-ft spreader beam so that its cables would straddle those of the heavier crane in the erection operation.

Erection was by booming alone. Crews replaced the 40-ft sections they had taken out for the moving operation, blocked the cranes into position, and lifted the bents into position with the same six-point pickup used in moving them. Turning the bent from horizontal to vertical position while in the air

made it unnecessary to reinforce the legs—or risk cracking them.

Each bent was guyed in place by four %-in. dia guy wires equipped with turnbuckles near ground level for plumbing the bents. Some bracing was placed almost immediately after erection, but the guy wires will remain in place until precast panels and concrete block filler walls are installed.

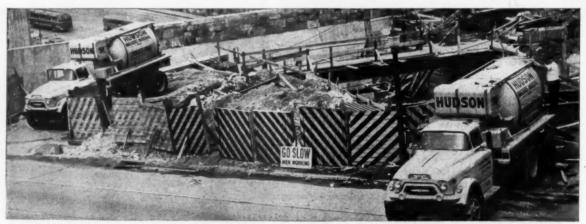
General contractor on the job is Trewitt & Shields of Fresno, Calif. The structure was designed by Donald Powers Smith, architect, and Isadore Thompson, structural engineer, both of San Francisco. Brigge Crane & Rigging Co., Oakland, erected the concrete bents. (Advertisement)

# "They're making 20% more trips a day than our other trucks working the Lincoln Tunnel job"



HUSTLING 6½ YARD LOADS (60,000-LB. GROSS) FOR THIS NEW NEW YORK-TO-NEW JERSEY LINK, Hudson Builders' new GMC W670 tandems have amazed their owner. "On hills where other trucks just manage to crawl, these

GMC's really roll," owner Harry Harris reports. "Our 70-truck fleet was formerly standardized on another make. But the GMC's top all the others—by plenty. You can be sure we're going to get more of them. And soon, too!"

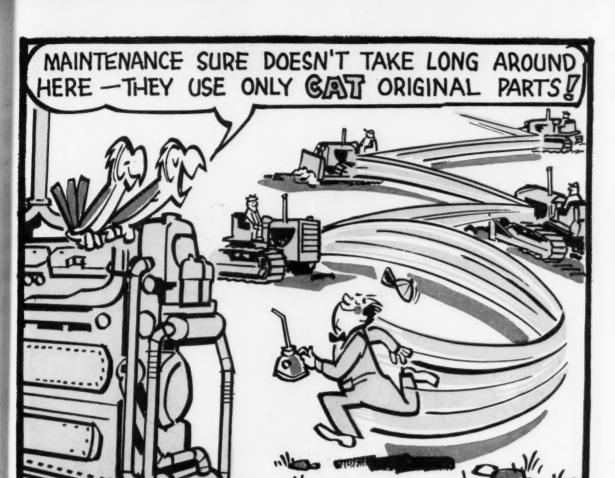


AS QUICK AND RESPONSIVE IN OFF-THE-ROAD WORK as they are over the highways, these GMC's save time at every delivery. Big 225 H.P. engine gives them power to breeze through tough going. Safety Power Steering\* makes at-the-job maneuvering faster and easier—lets you ease right

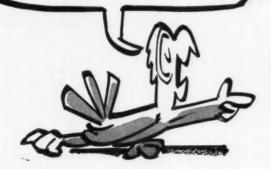
up to the edge of excavations and foundations. And the W670 is only one of the new GMC construction haulers engineered for any job up to 59,000 GVW-90,000 GCW.

GMC TRUCK & COACH

A General Motors Division



EVER BEEN FOOLED BY LOOK-ALIKE PARTS?
HERE'S A TIP...





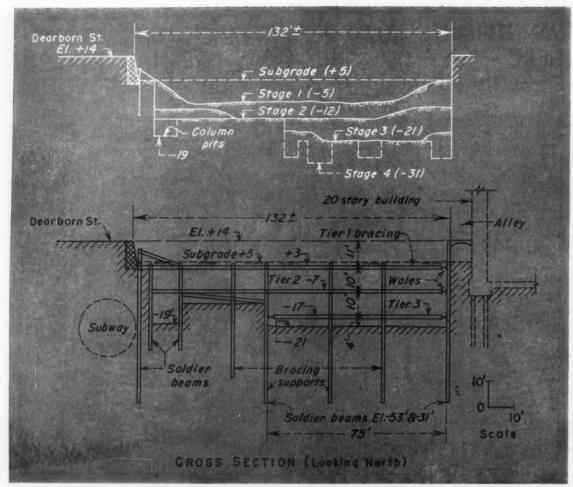
An engine bearing—not big, but mighty important. If it's a CAT\* bearing, it's an exclusive combination of aluminum alloy—extra strong with just the right degree of hardness. But if it's a "look-alike" bearing—who knows?

Be sure to get parts you can trust—from your Caterpillar Dealer. He always has the *exact* part you need. Play it safe—don't be fooled by "look-alikes."

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR\*





FOUR STAGE excavation and bracing procedure followed by contractor in excavating open pit through clay for Inland Steel Building in Chicago is shown in these cross sections.

# Clay Creates Sticky Foundation Problem

CLAY MEANS different things to different people. To a chemist it's Al<sub>2</sub>O<sub>3</sub>·2SiO<sub>2</sub>·2H<sub>2</sub>O. To a builder it's bricks. And applied to the faces of wrinkled old ladies it's been known to restore a semblance of lost youth. But to foundation contractors Spencer, White & Prentis, the sticky gook represents nothing but a headache—particularly that mass of it lying under the city of Chicago.

SW&P has been tackling an annoying 128x200x35-ft chunk of it for more than a year to put in a foundation for Inland Steel Co.'s new 19-story skyscraper in the loop area. The building was topped out Nov. 1, but SW&P workmen still are in the basement sweating out a tricky foundation problem born of the clay and Inland Steel's desire to break building convention in the city.

Buildings in Chicago traditionally sit on caissons: But Inland decided it wanted its new building to rest on steel H-piles. Inland's switch on convention didn't bother SW&P too much. The same meth-

ods are used to drive piles in Chicago as elsewhere.

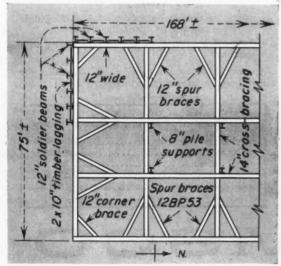
What did bother the contractor was Inland's desire to build three sub basements into the foundation to serve respectively as machine room, basement, and parking garage. That meant piles would have to be driven so that cut offs would be about 30 ft below sidewalk grade. That, in turn, meant the contractor would have to dig an open pit to cap the piles.

Open pit excavation in Chicago is risky because the soft clay creates high bank pressures that sometimes cause damage to streets, utilities, and adjacent structures. Normally, in Chicago, a trench is dug along the foundation wall line, walls are built within the trench, and the clay core finally is removed. This method, however, is slow and expensive.

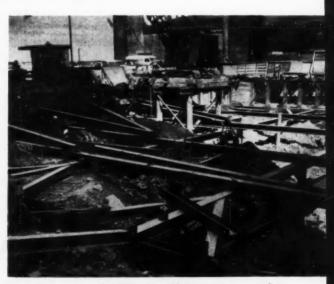
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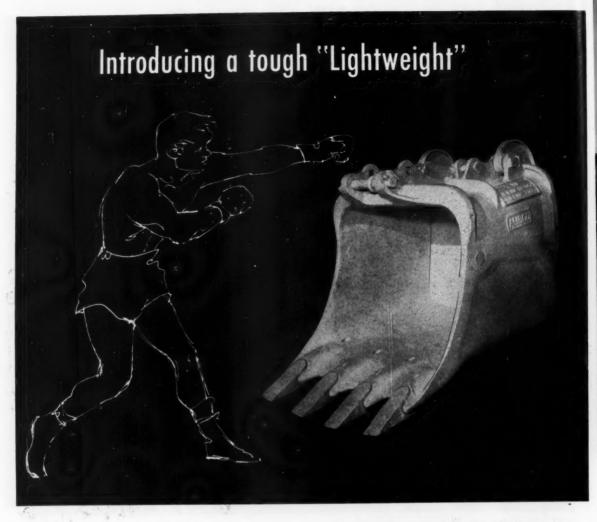
FIRST TIER of steel cross lot braces goes into place while cranes mounted on trestles clamshell clay from between braces. Second tier of braces goes in 10 ft under first.



TYPICAL soldier beam, wale, and bracing design can be seen in detail from bracing plan.



RAKERS give added support to cross lot braces wedged against horizontal wales.



# **NEW Amsco® Manganese Steel LIGHTWEIGHT DIPPER**

### Rugged 3/4 yd. dipper, made of the "toughest steel known," actually work-hardens under impact

Those big, tough Amsco Dippers now have a smaller brother. With this new, rugged, lightweight dipper, small shovel operators can enjoy the combined advantages of long-wearing manganese steel and proved Amsco design features, such as:

- · One-piece manganese steel back castings
- Arch formed by complete box section for maximum strength
- · Teeth are set for clean, fast digging
- Interior is designed for rapid dumping
- Lugs for handle, back, and braces are cast integral with back—for extra strength
- 25% lighter than standard Amsco ¾ yd. dipper, per-

mitting use on light-duty shovels and allowing their developed power to be more fully utilized

Curved door in back, for full-capacity loading with

Ask your shovel manufacturer for full information—or write us direct for descriptive literature.

#### "Vital Statistics" on this new lightweight champ

Height of	fre	ont	ov	er	1	e	e	tł	'n.									4	,	ft.	1/8	in.
Height of	bo	ck														0		. :	2	ft.	7	in.
Opening	at	top																	2	ft.	5	in.
Opening	at	bot	ttoi	n.															2	ft.	7	in.
Approxim	ate	w	eig	h	١.			×			*						*		1	550	0	lbs.



AMSCO

American Manganese Steel Division . Chicago Heights, III.
OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC

# How to put limestone and gumbo in their place



This is heavy going on a new section of four-lane U. S. 80 just east of Ranger, Texas. Collins Construction Co. of Austin put in 7.8 miles here and they handled 395,000 yards of material doing it. A lot of that was rock. And a lot was limestone and gumbo.

For this sort of heavy grading, Collins called in their CAT\* No. 12 Motor Grader. "Finest allaround grader I ever saw," says veteran operator V. W. Nichols.

Notice that operator Nichols sits down to handle his No. 12, even in rough stretches like this. If an operator has to stand to see his work, he tires much quicker, no matter how good he is. The operator of a No. 12 enjoys the convenience of in-cab starting, too, and power steering, and the exclusive Caterpillar accelerator-decelerator. Most of all, he enjoys the assurance he's at the controls of a tough, reliable machine that's built to do the hard work.

Backbone of the No. 12 is the strongest frame in any motor grader now on the market. Special channels make it that way. Box section circles increase its durability, as do its box-type drawbars. And the engine is of the same hardy breed—clutch, transmission, final drive are built to take heavy motor grader service.

Other features help explain the No. 12's popularity with operators and owners, too. Fast, accurate mechanical controls. Anti-creep brakes. Blade maneuverability that lets you swing from ditch cut to bank cut in less than a minute without adjusting links. Your Caterpillar Dealer will give you full details—and a demonstration, any time. He's ready with expert service, also—and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

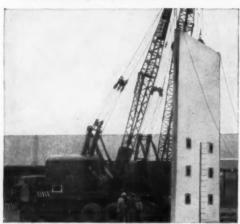
## CATERPILLAR\*

Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment





PANEL with large window areas



57 TON SLAB being positioned



ADJUSTABLE BRACES used for quick and easy alignment of panels



WAREHOUSE

DANIEL CONSTRUCTION CO. PHOT

# Tilt-Up Costs Go Down

# ...with SUPERIOR "Pick-Up" Inserts, Brace Anchors, and Braces

When an outstanding Tilt-Up job rates an article in a construction publication you can be almost certain that Superior products were used. The reason is simple. Superior, as the pioneer in this field, developed designs that were thoroughly tested both in the laboratory and the field to assure safety with economical prices and low application costs.

These "Pick-Up" Inserts, Brace Anchors, and Adjustable Braces have been used and proven on literally thousands of projects, not a few of which were unique in design. With a background of such experience, the recommendation of our engineers as to location and types of Inserts and Anchors is reliable and valuable.

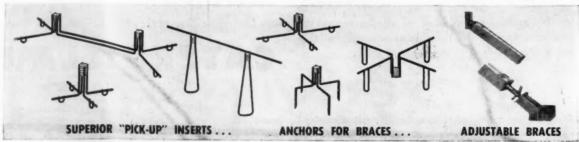
Avoid expensive crane delays, be assured of safety, and reduce your overall costs with these Superior products.

For further details request a copy of Bulletin TU-3

# SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, III. (Suburb of Chicago)

New York Office 1775 Broadway New York 19, N. Y. Pacific Coast Plant 2100 Williams St. San Leandro, Calif.



Buildings flank two sides of the Inland job. Streets flank the other two sides. To protect against caveins banks would have to be extensively braced and excavation done in and around the bracing.

"Designing our approach to the job was like planning a battle maneuver," said Edward E. White, executive vice president of SW&P.

Several buildings that stood on the site first were razed to about 18 ft below sidewalk grade. Their walls and basement floors were left intact to serve as temporary braces for banks and as mounts for pile drivers and cranes. Walls approximately followed the 128x200-ft overall foundation dimensions of the new building.

SW&P workmen under the supervision of Harry Armstrong, job superintendent, marked pile locations on the old floor slab then jackhammered out holes through which piles could pass.

Plans called for 393 bearing and batter 14BP73 piles 55 to 77 ft long to reach hard pan and bedrock beneath the clay. To drive them, Armstrong mounted three pile drivers on the old basement floor. And drove the piles until their heads came to about existing basement grade.

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With 30-ft followers made of steel pile sections, Armstrong then drove the piles to refusal. Cutoffs were to be made when excavation reached 30 ft below sidewalk grade.

#### **Placing Cross-Lot Bracing**

Bracing to support embankments next had to be placed. The contractor's first step was to drive 12BP53 soldier piles on 6-ft centers around the perimeter of the site to serve as reaction for cross-lot braces and as seats for timber lagging. Armstrong drove them about 60 ft deep with pile flanges running parallel to the building line so that he could slip in 3x10-in. lagging as excavation proceeded.

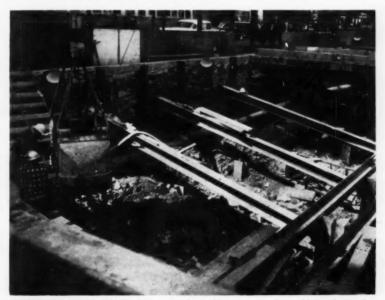
Steel 8BP36 posts next were driven on 25-ft centers throughout the site to serve as intermediate supports for the cross-lot braces. The posts also served as columns for trestles on which cranes later could be mounted.

Workmen then welded a 14BP89 continuous wale horizontally against the soldier piles about 8 ft. down from the sidewalk grade. This set the stage for placing of cross-lot-bracing.

continued on page 86



PILE DRIVERS are mounted inside early excavation to drive steel piles about 60 ft deep. Followers made from H-beams are mounted on cranes to drive piles to refusal.



STONE WALL against which soldiers have been driven is part of an old foundation that stood on site. The well was left in to supplement braces in supporting embankments.



# On Heavy Construction

Saves Work and Effort

"To push from a rear handle saw on heavy construction work is much easier than top-handle saws," says Mr. Joe Browning, Superintendent of the H. D. Tousley Co. Inc. of Indianapolis. "We have at times tried several makes, but "compare with SKIL Saws. They are the easiest to handle. I have seven saws on this project and they are all SKIL! One of them has been in use continuously for some ten years, yet we can depend on it to give us top-notch performance."

Made only by SKIL Corporation, Chicago 30, Illinois. Factory branches in all leading cities.



guipment-Superintendent Herb Wagner of the James McHugh Conruction Co., Chicago, says this about the SKIL Motor-generator adial Saw "One of the handlest tools on the grounds. It's power us on wheels. Can be moved at moment's notice to any spot. It as plenty of guts for all of our cutting needs. It's the perfect saw r large construction-adaptable and versatile-a must for conruction areas where power is always a problem



P. J. Flannery, purchasing agent for the Soo Construction Co. Winona, Minn, tells how SKIL Super-duty saws have saved for his These forms must be resized for further application. The saw must cut through this foreign matter without babying. We are interested in one thing-will they take it and keep maintenance costs down.



"Our SKIL Saw has more than paid for itself after only three months of use," says Mr. Ed Garland, Supt. of Maintenance of the Huey Long Bridge Sub-Dept., New Orleans. "By using the SKIL Saw we eliminated the cost of material handling and any farming out for cutting. We use it wherever it is needed. It does everything that we have asked and then some. It has saved our department time and headaches - and the taxpayers money



Save time and labor. Save as much as 50% in labor costs with the SKIL Radial Saw shown above. The fastest cutting radial saw made. No matter what you have to cut, there's a SKIL Saw for you. It can do the job faster, better, cheaper. Let your SKIL distributor show you why. Let him show you the speed, power, versatility and ease of handling of all SKIL power saws. Or use the coupon below for further information.

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#### FOUNDATION PROBLEM . . . continued from page 83

#### **Braces Are Pre-Stressed**

SW&P figured a checkerboard pattern for cross-lot bracing would be most effective. Additional bracing would be provided by raking spur sections from each brace to the horizontal wale.

Normally, these long braces require prestressing to insure a tight fit against the wale. This is done by setting jacks on each end, exerting a predetermined load, then welding splice plates between brace ends and wale.

To avoid having to stress each brace and spur individually, the contractor decided to do the stressing from the center point of the brace. Thus braces and spurs would be stressed in one operation. This idea cut the stressing time by two-thirds.

The 128-ft braces first were placed in two 63-ft sections over the intermediate posts and supported by steel straps. Ends and spurs were welded to the wale. This left a 2-ft space at the center of the brace.

Armstrong welded a steel plate to each open end. Against these he placed two 75-ton hydraulic jacks and applied a 150-ton load. While jacks held the brace tight, a splice plate made from a section of H-beam was placed between the open ends and secured with steel wedges. The whole stressing section then was welded tight, the load from the jacks was released, and the jacks were removed. The contractor placed 200-ft cross-lot bracing transversely over the 128-ft lengths and stressed them in the same way.

#### Excavation

SW&P built two 18-ft trestles 60 ft in from the adjacent street to serve as crane mounts. A smaller crane platform was built on one of the sides flanked by a building. Cranes with clamshell buckets could boom out from one of the three trestles to reach all parts of the job.

When excavaiton had proceeded about 10 ft, small beam sections were lowered through the upper tier of braces and welded into lengths for a second tier of crosslot braces. They, too, were strapped to posts and prestressed.

A third tier of braces 28-ft below sidewalk grade finally was placed in this manner to complete the bracing. At about this time, pile heads were becoming exposed. The



MAIN COLUMNS of welded structural steel are sheathed in stainless steel. They stand outside building's curtain walls to keep floors free of columns, adding to floor area.

excavation was trimmed, and pile cut-offs made.

A careful check of bank movements was maintained continuously. Strain-gage measurements also were made of the braces to assure that actual loads in the braces did not exceed theoretical computed pressures. Checks showed that movements of the banks were minor, and that brace pressures were less than allowed.

Turner Construction Co. of New York, the general contractor, then took over concreting pile caps and walls in and around the braces. Once walls were completed, work began on erecting structural steel. During steel erection Turner crews began installing sub-basement structural floor slabs while SW&P workmen stood by to remove braces as floor slabs were installed. This work still is going on.

Inland's new building rises 252 ft above street level and has a 25-story service tower that extends 80 ft higher.

The office building's most striking feature is the arrangement of its 14 main columns. They extend up along the outside face of the exterior walls like giant ribs. Seven columns are spaced about 25 ft apart along one side of the building and seven along the opposite face. They are welded structural steel, 4 ft deep by 22 in. wide and are faced with stainless steel.

There are no interior columns. The two lines of exterior columns are connected at each floor with 58-ft structural steel girders that carry the entire floor. Typical floors of the office building have an unobstructed area 58x177 ft, totaling 10,250 sq ft. The office building, with its three-level basement, a two-story annex, and the service tower, contains a total floor area of 300,000 sq ft.

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Exterior walls will be stainless steel and glass. Adoption of this thin, lightweight exterior curtain will save about 200 tons of structural steel. Interior walls will be movable steel partitions for maximum flexibility of office arrangement

Structurally, the floors are cellular panels of 16-ga galvanized steel topped with  $2\frac{1}{2}$  in. of lightweight concrete. The finished floor covering is laid over this slab.



# Thermoid helps assure performance of versatile "SPREAD-MASTER"

In surfacing roads or airport runways, this self-propelled Power Spreader, produced by Flaherty Mfg. Co. of Pocatello, Idaho, applies as much as 150 tons of abrasive aggregate an hour! Because continuous uniform conveyor operation is a must to prevent seams or streaks, Flaherty chooses Thermoid Conveyor Belting.

The two 20" belt conveyors are equipped with tough, durable Thermoid 4-ply Belting, specially selected for the work to be done.

There's a Thermoid Belt for every type of material handling problem. Because each belt is specifically designed for the job—you're assured longer wear, less downtime, fewer replacements.

Make Thermoid your choice, too, for Multi-V Belts...



... and Hose manufactured with your needs in mind

Ihermoid



Thermold Company Trenton, New Jersey Nephi, Utah

Your Thermoid Distributor can help you select the right Conveyor Belt, Hose and Multi-V Belts to lower your operating costs.

#### Dependable All-Wheel traction

## One of 9 reasons why you'll find

#### International Trucks

#### cost least to own!

Here are 4-wheel-drive and 6x6 trucks that need no roads. They make their own with all wheels *working*.

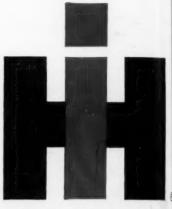
You get dependable sure-footed traction and extra pulling power to go through sand, mud and snow . . . up the steepest grades with a full load. No need to take the long way around. Ideal for highway hauling, too.

Every International All-Wheel-Drive model is completely factorybuilt for reliable performance and lasting economy...built to cost *least* to own.

And fleet cost records prove\* that International Trucks do cost least to own.

Why not start saving more, earning more money right now with the rough-and-ready truck that goes everywhere. Your International Dealer is the man to see.

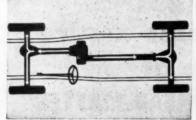
\*Signed statements in our files, from fleet owners throughout the U.S., back up this statement.



International Harvester Company, Chicago Motor Trucks • Crawler Tractors Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



1 All wheels are working for you with this International 6 x 6. Get to places never before possible. Rough terrain and hills are easily negotiated. Save valuable time and money. Models for every job, 7,000 lbs. to 43,000 lbs. GVW.



2 Two-speed transfer case transmits power from the transmission to front and rear axles or rear axle only. Quiet, cloverleaf design for straight-thru drive, extra dependability and lowest maintenance. Full torque power take-off available.



3 Brakes with big lining areas are the self-energizing type for low pedal pressure and sure stops. Sealed to keep out dirt and moisture for greater dependability and reduced service. Power brakes standard or available on all models.

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4 Every cab is a full-sized beauty. Plenty of leg and head room, 3-man-wide seats. Sturdily constructed with double back walls. Special cab mountings, rugged understructure and bracing to stand up under the most extreme conditions.



5 International Steel-Flex frames are constructed with cold squeezed rivets for added strength and durability. S-120 (4x4) models have kickup for extra low loading height. Larger models have full loadlength reinforcements.



Easy, positive steering with over-size cam and roller-mounted twin lever gears. Controls mounted ahead of the front axle. You get greater stability, less shocks, comfortable steering angle . . . best handling on all types of terrain and roads.



This is the popular light-duty Model S-120 (4x4) INTERNATIONAL Truck. Features full-size, 3-man-wide cab and a choice of 12 different full-size, factory-built bodies, including the widest 6½ ft. pickup in the industry. Powered

by 131 hp., short stroke, 6-cylinder engine, gasoline or LPG fuel. Available with factory-installed 8,000 or 15,000 lbs. capacity front-mounted winch, snowplow and other specialized equipment.



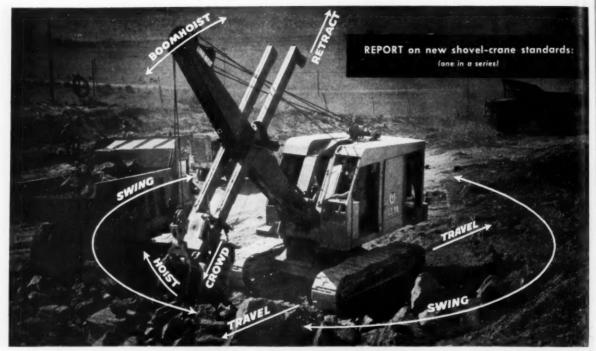
7 Dependable, economical power with sixteen 6-cylinder engines, up to 212 hp. Heat-treated, forged steel crankshafts and big bearing areas for a longer, more useful life. Precision machined, quiet, long lasting timing gears, too.



8 Save time and money. Get the truck that matches your job exactly. No need to compromise with the great span of 12 factory-built INTERNATIONAL 4x4 and 6x6 models, 7,000 to 43,000 lbs. GVW. Choice of job-matched components.



 World's most complete line. There is an International "tailor-made" for every truck job, ½ tonners to 90,000 pounders. Choice of 4-wheel, 6-wheel and all-wheeldrive models, conventional and COE design. Every one built to cost least to own.



ALL OPERATIONS ARE COMPLETELY INDEPENDENT — In addition to eliminating shifting time, *Independent-Travel* allows the operator to swing and hoist the load while travelling. Whether to

save time or to jockey the boom around obstacles, the operator can swing the boom while his machine is travelling in either direction. This optional feature can be used with any front-end attachment.

# Getting 9 hours' output in 8

Independent-Swing-and-Travel is available on 11 Link-Belt Speeder models. Eliminates shifting . . . saves 20-30 seconds each move

Link-Belt Speeder users are setting new high-production standards by equipping their machines with *Independent-Swing-and-Travel*. Why? It eliminates time losses ordinarily occurring when the operator shifts from swing to travel and from travel to swing. With *Independent-Travel* shifts are eliminated and the machine can swing and travel simultaneously . . . you can jockey the boom around obstacles in tight quarters, move away from bank cave-ins in split seconds!

If you'd like complete details, proof that *Inde*pendent-Travel can up output . . . cut maintenance and spare parts costs, too — see your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.



MORE USABLE HORSEPOWER — Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

14,324

It's time to compare...with

## LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

Page 90 - CONSTRUCTION METHODS and Equipment - February 1957



TUTTLE CREEK DAM is a relatively compact job. Spillway excava-tion (foreground) supplies material for easy downhill haul to up-

stream face of dam. Dredge in borrow pit about 1/2 mi away pumps

## **Dredge Rescues Big Dam Job**

A SWITCH to hydraulic placement has taken a contractor off the spot on which he found himself when earthmoving equipment bogged down in placing the embankment for Tuttle Creek Dam across the Big Blue River in Kansas.

In turning to a dredge, List and Clark Construction Co. of Kansas City, Mo., has undertaken one of the biggest jobs of hydraulic placement of dam fill in recent years. The firm holds a \$4.2 million contract to place 8,500,000 cu yd for the embankment. Of the total about 2,900,000 cu yd will be placed hydraulically.

The work will carry the full section of the dam-which will be 7,500 ft long when completedfrom the left abutment out 3,500 ft to the point where the river now flows. Height from the river bottom to the crest will be 157 ft. continued on page 94



DREDGE, custom built for the job, is made up of four pontoons assembled at the site. Contractor erected the superstructure on the 90x30-ft hull and installed the machinery.

# The Now cedarapids bituminous paver

#### introduces an entirely new concept in bituminous paving

Imagine a bituminous paver with an electric vibrating screed and a controlled vibration intensity that not only compacts bituminous mix into a smooth, uniform high-density mat, without segregation . . . but is setting new records for high-speed, high-capacity paving!

Imagine a bituminous paver that has placed material from ten 14-ton trucks in 15 minutes... that can hit paving speeds up to 102 ft. per minute... with the finished pavement free of voids or tears in the mat, and testing as

good as pavement laid at much slower speed!

Imagine a machine so simple in design and so ruggedly built that a test model operated for 935 hours, over 385 miles, with practically no mechanical difficulties, and showing very little wear!

THAT'S THE NEW CONCEPT IN BITUMINOUS PAVING... achieved with the many new and different design features of the all-new Cedarapids Bituminous Paver.

#### HERE'S HOW YOU PROFIT WITH THIS NEW, DIFFERENT PAVER

#### Greater Speed and Capacity

Tests have proved that the paving speed and capacity of the new Cedarapids Bituminous Paver are generally limited only by the output of the mixing plant, truck movement, or the ability of the rolling equipment to keep up. Paving speeds range up to 102 FPM. Rapid vibration of the screed assures maximum density at any paving speed, without tearing the mat or creating voids. Capacity is conservatively rated in excess of 200 tons per hour.

#### Simplified for Lowest Maintenance

Simplified design means more "go" time and less down time. A number of troublesome chains, drive shafts and universals have been eliminated. This reduces the number of wearing parts and mechanical drive linkages required. See the table for comparison with other leading pavers!

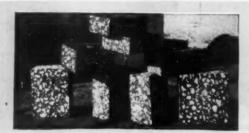
	Chains	V-belts and drives
Cedarapids Paver	6	2 belts with 1 drive
Paver A	15	5 belts with 5 drives
Paver B	12	10 belts with 4 drives
Paver C	17	9 belts with 3 drives

#### Assures Better Quality Pavement

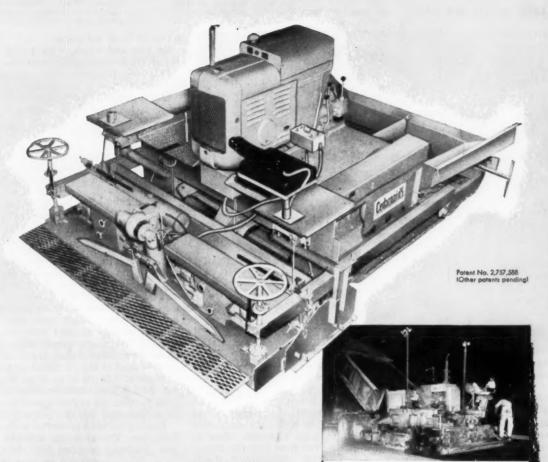
The new Cedarapids Paver meets the most rigid specification demands of the Federal Highway Program. On turnpike tests, inspectors found paving mixes spread by this machine to be uniform as to density, surface texture and desired thickness. Careful examination of dozens of density samples from unrolled areas of both binder and surface course revealed no segregation . . . neither open textured areas where coarse aggregate predominated, nor segregation by particle size.

Automatic depth controls assure the proper amount of material in front of the screed at all times with no attention from the operator... an important feature for preventing voids when paving at high speed. Steering is easy. Long screed support arms pivot well forward on the Paver, with a ball joint connection which allows minor side movement of the screed to assure straight mat edges and even joints on the straight-away as well as on curves. The long screed arms and long crawler base provide maximum screed floating action to minimize irregularities in the subgrade.

These exclusive Cedarapids design features result in highest quality pavement, with the riding quality demanded by safety for today's high speed travel.



These pavement cross sections are typical random samples cut from both binder and surface courses of the Kansas Turnpike. Such uniform distribution of coarse and fine aggregate is typical of pavement laid with the new Cedarapids Bituminous Paver.



#### HERE ARE A FEW OF OVER 40 NEW FEATURES

- Four individually controlled, electrically driven vibrators deliver 3,600 impulses per minute to screed.
- Automatic feed conveyors and spreading screws.
- Completely self-cleaning track-type crawlers reduce maintenance, prevent screed-disturbing build-up of material.
- Big hopper handles up to 9 tons of material.
- Paving widths easily adjusted . . . no tamper or cut-off bar to consider.
- Electric clutches and brakes minimize wear.

#### TESTED AND PROVED ON THE KANSAS TURNPIKE

This Cedarapids Paver was used by Reno Construction Company to lay 130,000 tons in a little over two months on the Kansas Turnpike. Operating day and night, the Paver laid 3,475 tons, or all the mixing plant could supply, in one 16-hour period. Note the relaxation of the operator. Finger-tip operation, with no foot controls, adds to the Paver's easy handling.

IOWA

MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa, U. S. A.

Gentlemen: Please send Bulletin PAV-1 and further details of your new Bituminous Paver.

Name\_\_\_\_\_

Address\_\_\_\_\_\_Zone\_\_\_State\_\_\_



PARALLEL LINES of pipe on 15-ft trestles discharge sandy spoil on downstream face. Dike at toe of dam traps water and leads it by ditch back to dredging pit for reuse.

The dam has a central impervious core composed mostly of clay. The upstream portion is shale and limestone. The downstream portion is sand, topped by random fill and weighted down by a berm. Quantities are: core, 1,175,000 cu yd; upstream side, 2,294,000 cu yd; downstream side, 2,900,000 cu yd; and berm, 1,155,000 cu yd.

In laying out the job, the contractor expected no trouble in placement of the core and the upstream portion. Shale and limestone come out of the adjacent excavation for the spillway and are transportable by a downgrade haul road. The impervious clays for the core are close at hand on the valley floor.

But the sand for the pervious downstream fill promised to be a problem. A deposit of sand lies in a pocket about ½ mi downstream from the dam's toe. It is from 6 ft to 65 ft below the surface. Major part of the overburden is clay that might be used in the core, but between the clay and the sand there is a layer of useless silt that must be hauled off and wasted.

The List and Clark contract gives the contractor the option of either hydraulic or land placement of the sand. Because it had little dredging experience, the firm first sounded out subcontractors about hydraulic placement. It found all of them fearful of the adequacy of water to float a dredge; some came up with such elaborate ideas as diverting the river into the dredging pit; all safeguarded them-

selves in their bid prices.

So List and Clark, with a unit bid of 39c for placing the sand, decided to do the work with earthmoving equipment. There followed a series of complications that added up to a slow, difficult, high-cost operation.

Trucks moving into the pit for loading found the going heavy in the shifty sand. The contractor had to station tractors at the loading pit to help the trucks through the sand. Even so it was slow work. When hauling clay, trucks cycled at five loads per hr with no help required. When hauling sand from the same location, the rate went down to three loads per hr.

As soon as the sand pit was dug down to groundwater level, draglines had to dip the sand from under the water, and this resulted in a lot of wasted effort. Three bucketfuls loaded a truck with clay, but six buckets of sand were required. Trucks were expending a lot of their effort hauling water. A yard of sand at the pit added up to only about 0.85 yd in place on the fill. And maintenance costs were high because the abrasive sand cut up rollers and tracks.

Placing the sand presented problems, too. The principal difficulty was obtaining specified 95% den-

continued on page 98

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REPOSITIONING the pipe is simple. A dragline pulls the trestles out, and they are reset with the help of a water jet. Then the dragline places the pipe in the new position.

Traveloader loads up to 600 yards per hour from stockpiles... moves and maneuvers fast to fill orders for material of various specifications... keeps big truck-fleet working steadily. Cross-conveyor (optional), shiftable left and right, directs material to trucks at either side ... speeds loading, cuts positioning time, balances load.





## Cut truck-loading costs!

# Speed handling of aggregates, loose dirt, topsoil with fast-loading TraveLoader

What is it costing you to load aggregates, surplus dirt, and other loose materials into trucks? Are you loading fast enough to keep your haulers busy? . . . to keep ahead of pavers? . . . to keep your jobs on schedule? You may find it worthwhile to re-examine your ruck-loading methods carefully, then figure out where you might save time and money with a high-speed, rubbertired Adams TraveLoader.

#### Handles big yardage fast

TraveLoader loads a truck in less than a minute from windrow, stockpile, or bank. It loads up to 600 yards per hour—dirt, sand, gravel, crushed stone, slag, topsoil, cinders, snow, and many other non-packed materials.

Here are a few typical applications where mobile TraveLoader heaps trucks faster at lower cost:

LOADS AGGREGATES: TraveLoader handles materials from stockpiles at aggregate plants, in materials yards, or

rail-heads, for transport to ready-mix plant or job. Machine reduces truck waiting time . . . loads trucks in 40 to 60 seconds . . . moves and maneuvers quickly from one job to another at loading site . . . travels fast between plants and yards.

LOADS SURPLUS DIRT: TraveLoader picks up windrowed dirt in continuous motion, without scattering material. It works on road shoulders, loading to the rear . . . does not interfere with



Traveloader digs and loads topsoil, sand, gravel, and other materials from natural bank without prior preparation.

passing traffic . . . loads excess material from streets and between foundations in subdivisions.

STRIPS TOPSOIL: TraveLoader cuts and loads topsoil and other materials from field or natural bank without prior preparation.

#### These features cut your costs:

Power feeder on TraveLoader gathers material from a width of 8' and places it on conveyor belt. Machine has 5 working speeds, 0.29 to 1.9 mph... travel speeds to 26.7 mph. Conveyor discharge height is adjustable from cab for filling trucks of any height without spillage... without excessive dust. TraveLoader heaps trucks at its rear, or with optional cross-conveyor, at either side... evenly distributes full load for fast over-the-road haul.

Cab is centered over conveyor — out of the dust zone — where visibility of material, feeder, conveyor, and trucks is good. Positive, convenient controls make loading simple . . . maneuvering and traveling as easy as driving a truck. TraveLoader is powered by either 55 hp gasoline or 60 hp diesel engine, machine weighs 16,700 lbs.

#### See TraveLoader at work

Make a date to see TraveLoader in action. See it load at the rate of atruck-a-minute (including truck positioning time). That's the best way to appreciate its money-making possibilities on your work. Write or phone us for the names of users working Trave-Loader on projects similar to yours.



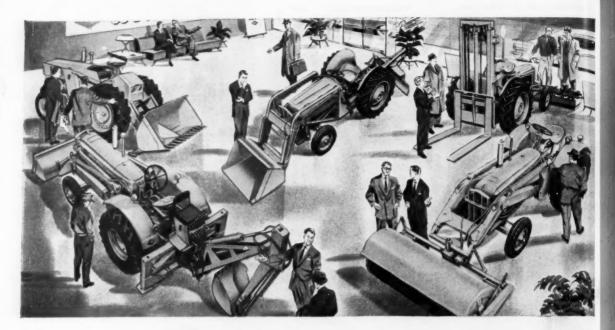
Making clean 8' wide pick-up, Traveloader loads surplus material windrowed on road shoulder, without interference to passing traffic. AL-1105-H-b



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT



5 tractors, 20 interchangeable attachments

# new family of power-matched packages

for scores of jobs

M-H-F WORK BULLS PAY OFF as high-performance, money-saving units for contractors, utilities, industry, municipalities

The reason — integrated design! Both tractors and attachments are designed for multiple machine versatility. For example — a Work Bull with a loader mounts interchangeable attachments that quickly, easily convert the same tractor into a highly efficient backhoe, fork lift, swinging crane, grader or any of many other highly efficient tools. And at a surprisingly low cost.

In five to 15 minutes you can mount or dismount any Work Bull attachment.

Switching involves merely one man—no wrenches, no special gear. And front-end attachments utilize the same hydraulic arms and frame. Backhoe attaches or detaches in less than 5 minutes!

Work Bull attachments include the loader, blade, fork lift, mower, backhoe, snow plow, auger, broom, pipe and cable layer and others to meet your specific needs.

Get full details and the name of your nearest distributor. Write for 24-page catalog.

Enjoy the advantages of a single source, one responsibility for sales and service on both tractors and attachments!



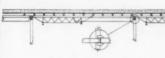
Division of Massey-Harris-Ferguson, Inc.

20-B QUALITY AVENUE • RACINE, WISCONSIN





Page 6. Spanall installs fast



Page 5. <u>Spanall</u> applies to any type of poured concrete construction.



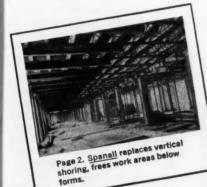
Page 7. Plywood decking laid directly on Spanall.

# Newest Catalog features new way to

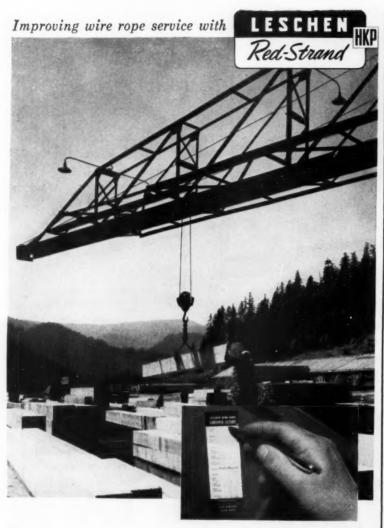
# save time, cut costs

Here is practical, profitable information about Spanall, the popular, new, allmetal Horizontal Shoring for concrete forms. Photos, charts and drawings clearly illustrate how Spanall is erected, stripped and stored-with new ease and speed...how Spanall adjusts quickly to any required span length-how Spanall forever eliminates cumbersome, costly vertical shoring ... and actually saves as much as 40% in both time and money.

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# How much can you save with Leschen wire rope service?

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Service-Score Stickers are available from any Leschen field man or distributor. Just ask, or write Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.



#### DREDGE BUILDS BIG DAM . . . continued from page 94

sity. The sand is relatively high grade, but it contained enough silt and fines when dipped up by dragline so that water did not drain freely. For compaction equipment to work the fill, it had to be so dry that it was almost impossible to obtain the required density. If it was wet enough to compact, equipment wouldn't work it. List and Clark's rollers bogged down completely. They found the best results were secured by walking the job with wide-tread tractors, but this was slow going.

All through the early part of the 1956 construction season, the firm fought the sand with earthmoving equipment. Then it decided to buy a dredge and switch to hydraulic placement. It stopped placing sand about July 15 and did not resume until late in November when the dredge was ready to go to work.

The dredge is a \$250,000 investment, custom built for this job. Missouri Valley Machinery Co. of Leavenworth, Kans., fabricated the 90x30-ft hull which is made of four pontoons that were trucked to the site and assembled. List and Clark erected the superstructure and installed machinery. The dredge has two pumps, one of 1,250 hp and one of 1,500 hp. The contractor is considering adding a booster pump of 1,500 hp to boost production.

Discharge pipe is mostly 20-in. scrap pipe because the contractor was unable to get new pipe in a hurry. It is welded into 120-ft lengths on the land sections for easier handling. The section from the sand pit to the distribution area is laid on the ground. In the distribution area, the pipe is on wood trestles 15 ft high.

Pipe in the distribution area is set in parallel lines. Discharge is through 8x15-in. manually operated bottom gates spaced 15 ft apart. Between 15 and 20 gates are used at a time.

Spoil is deposited until it builds up to within 2 ft of the pipe. Then the pipe is disconnected and a dragline pulls the trestles out of the muck. Trestles are reset with the help of a water jet, and the dragline then repositions the pipe.

In the discharge area, there always are at least two parallel lines of spoil pipe so that one line may be reset while the other continues to discharge. An additional advantage is that this enables the

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slope of the sand embankment to be held flat enough so that the material will distribute itself smoothly and to grade.

Placement has yet to reach the scheduled total of 15,000 yd per day, but it has hit 13,000 yd on occasion. List and Clark is considering the substitution of a cutterhead for the suction head on the dredge to boost production.

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But already it's clear that the contractor has licked the problem of sand placement. The dredging action refines the sand so that silt and fines are carried off by the water, and the sand compacts itself to required density with no additional working by compaction equipment. And water supply has proved no problem. The pit was pumped full for initial dredging, and the area is laid out so that water drains back to the dredging pit for reuse.

Indications are that dredging can proceed without interruption through the winter. With earthmoving equipment, it would have been necessary to turn over the surface of the sand every morning and allow the sun to take the frost out of it. Probably it also would have been necessary to shut the job down completely by late December.

The dredge promises to bring the job back into balance. The core of the dam cannot be built up beyond certain limits unless it is buttressed on one side by shale and on the other by the sand. Slow progress in sand placement has limited the height to which the core could be carried.

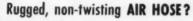
But with uninterrupted dredging this winter the prospect is that sand placement—now nearly 20% behind schedule—will be back on schedule when the construction season opens in the spring and work can be resumed on the core.

Lis and Clark holds one of the two major contracts on the dam. The other is a \$3.7 million contract for construction of two 20-ft flood control conduits 838 ft long and for the control structure and stilling basin. The contractor for this work is Tecon Corp. of Dallas, Tex.

#### CONCRETE WORK

Contractors doing concrete work will find CM&E's booklet on Concrete Mixing and Placing valuable. It costs 50¢. Ten or more, 40¢ each. Write the editor. Which
QUAKER
HOSE
do you
need today...

to cut costs tomorrow?



Though lightweight for easy handling, this hose won't snake or twist under pressure. It takes dragging... resists oil damage... withstands cracking at temperatures as low as 20°F. Tough Neoprene cover withstands all weather conditions.

#### Easy-to-handle WATER HOSE?

This all-purpose water hose is long on wear and value. Easy to handle, it has a black, high-grade rubber cover that resists sun, weather, cracking and peeling. Black, non-porous tube.

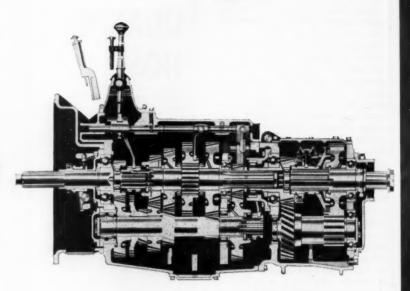
#### Strong, durable SUCTION HOSE?

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# **GULF PRODUCTS and FINE SERVICE**

# keep equipment rolling on Georgia State Farmers Market

One and a half million cubic yards of dirt will be moved in grading, excavating and drainage for the new State of Georgia Farmers Market near Atlanta. MacDougald Construction Company of Atlanta has the contract for this million-dollar project.

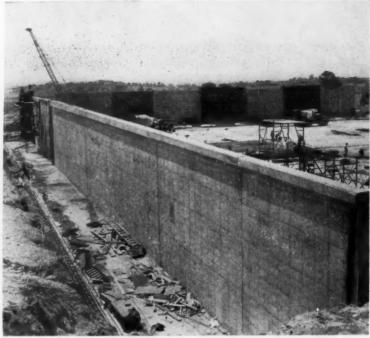
The job is scheduled to be completed in 100 working days, so MacDougald Construction Company is using Gulf petroleum products exclusively. They know that Gulf quality lubricants protect against mechanical delays, while Gulf fuels insure top engine performance. And they know they can always rely on Gulf to make prompt deliveries.

Fifteen hundred Gulf warehouses are ready to serve you, too, and Gulf petroleum engineering counsel is yours for the asking. For more information, call your nearest Gulf office or send the coupon for a copy of "Gulf and Your Business."





CRANE LIFTS prefabricated form into place alongside previously placed section.



CONTRACTOR POURS Lancaster reservoir wall in alternate sections with gang forms to speed erection time. Job has 1,440 ft of battered wall, 22 ft high, and 12 to 26 in. thick.

## **Standard Panels Make Handy**

BY BOLTING together standard steel-ribbed form panels into a single 370-ft unit, a Lancaster, Pa., contractor whipped himself up a handy set of prefabricated gang forms for a reservoir job.

The contractor thought up the idea mainly as a way to use standard panels he had stored in his yard. But he got as a bonus a form unit that was cheap to build and held advantages conventional form sections lack.

Damaged portions of the form easily can be replaced simply by removing a panel and putting another in its place. Single panels can be removed temporarily from the form to permit pouring from any desired height. And the steel frame that is the core of the form cuts down considerably on bracing normally needed to keep a large-area form from buckling.

Binkle Construction Co. used the forms to erect 1,440 ft of battered concrete wall on a \$540,000 reservoir in Lancaster. Walls for the storage tank are 22 ft high and 12 to 26 in. thick.

Battered walls that high usually are troublesome. About the only way they can be formed economically is with prefab sections that can be handled by crane.

But the contractor had on hand a number of Universal's Uni-form panels in various sizes that he uses for foundations. Uni-forms feature a reinforced steel frame to which a sheet of plywood can be bolted and replaced when worn.

"Why not," reasoned project manager John F. Hunt, "bolt these together like we would for a normal foundation, add bracing, a means of lifting, and use them as a unit."

#### **Gang Standard Panels**

Hunt fabricated five panel sections measuring 18x22 ft. Panels are ganged together in four rows of eight. Hunt uses three rows of 2x6-ft panels and one row of 2x4-ft panels. These are bolted by their vertical frame members to 2-in. channels. Channels serve as braces for form ties.

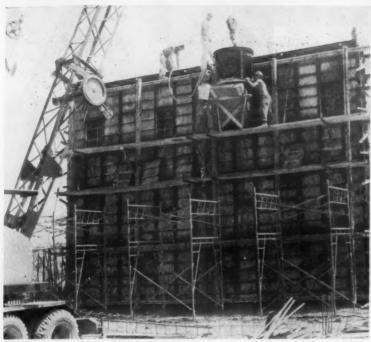
Each row of panels is given additional bracing by two pairs of 2x6-in. walers. These are secured against the panel frames by tie-wire and hairpins. Additional braces are set transversely against the walers on 6-ft centers.

Along the top row of form panels, Hunt bolts a standard 6-in. channel with holes bored through it at 6-ft centers for lifting the form section by crane.

Two form sections are set side by side on each wall face in order to pour a full 36 lin ft (792 sq ft) of wall at a time. The fifth form section is a standby. This is used both in emergencies and to initiate erection of a new pour section while the stripping of previously placed panels is under way.

Form sections are lifted into place by crane and secured by tie-bolts. Only the outside form—which is placed on a batter—is lightly braced against the outside embankment. Hunt bolts scaffold brackets to inside form faces to provide a scaffold that travels with the form.

For the pour, workmen simply remove any panel from the inside form face of the section, set a chute against the opening, and pour by bucket. This permits placing concrete at any desired height or location.



BY LIFTING panel out from any section of form and fixing a chute to the opening, contractor can pour concrete from any desired height or location on the form's inner face.



CHANNELS PLACED between form panels provide a seat for form's tie bolts.

## **Gang Forms**

Stripping simply is a matter of placing crane hooks through the upper channel and releasing the tie-bolts, which causes the form to come free.

Hunt builds the concrete walls in alternate 36-ft sections. Doing this enables him to return and place the gang forms against existing wall sections. This eliminates lost time in lining up the forms and bracing them against the embankment.

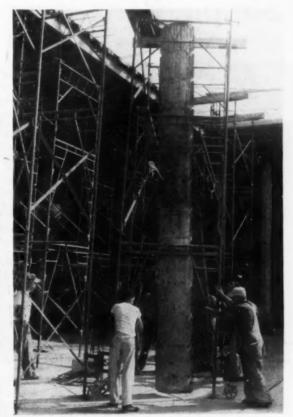
#### The Reservoir Roof

Columns, 22 ft high and 16 in. in dia with drop heads support an 8-in. reinforced concrete roof slab. Hunt uses circular steel forms for the columns. Patent tubular scaffold towers serve as braces to hold column forms in place. Column forms are moved along with the towers for speedy erection.

The scaffolds, fitted with jack-type casters, permit one sixth of the roof area to be worked at a time. To form for this, tops of the tower legs are fitted with adjustable U-heads. Post-type shores with adjustable heads supplement the towers. Each tower supports two 2x8-in. stringers placed face to face within the head. Over these, Hunt transversely places 2x4-in. studs on 12-in. centers. Plywood panels are tacked over the studs.

#### Forms Easily Stripped

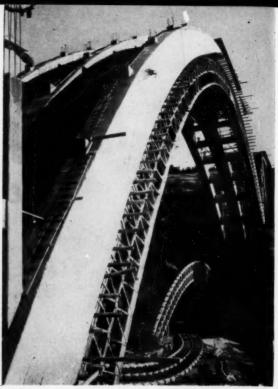
Once the roof has been poured, a whole section of roof forms can be lowered by unscrewing the adjustable U-head. Forms are dismantled and casters then are jacked down permitting towers to be rolled quickly to their new location.



COLUMN FORMING is simplified by rolling forms to new location while attached to Patent's scaffold towers set on casters.



LAMINATED PLANKS separated by diagonals span 330 ft in northern Italy. One section is hoisted while others are built below.



SECTIONS OF CENTERING are stripped from underneath concrete arches. Undamaged by clamps, planks can be used again.

## Simple Centering Goes Up Fast



U-BOLT CLAMPS tie together bundles of laminated planks on another Italian bridge.

A NEW TYPE bridge centering developed in Italy is gaining wide popularity throughout Europe and may soon be introduced in the United States.

Basically, it consists of laminated wood planks clamped together on the outside with bolts or turnbuckles. Made in single, double, or triple bundles, separated by diagonals, the new centerings are accurate and economical. They are made from stock lumber, require no intermediate supports, and are completely salvagable.

Unlike a cut, riveted, or glued centering, this new type structure is held together with outside clamps that cause no damage to the planks and permit maximum reuse.

Generally, the centering is assembled on the ground below or near the bridge. The assembly usually is surfaced with wood to permit the fabricator to draw the curved sections. Planks are positioned in the bundle in such a way that all joints are lapped. Clamps are attached and tightened to create enough friction to overcome any internal sliding. The bundle acts as a homogeneous section.

When a two-bundle section is required, the bundles are assembled at constant distance and connected by wood diagonals. All parts are held by friction. Diagonals are seated on double wedges, and then the entire unit is tightened by clamps consisting of channels, U-bolts, and turnbuckles. Clamps are positioned diagonally to attain the proper friction between planks. For very long spans, a three-bundle centering is often required.

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Methods of erecting depend on job conditions. In the simplest cases, a crane can handle the entire operation. But on the larger spans, cableways have proved more effective.

When in position, centering ribs are connected to each other and stiffened with lateral metal struts and guy cables.

Credit for developing the new method goes to an Italian engineer, Dr. E. Cruciani, who collaborated with Dr. A. Benini, professor at the University of Rome. More than 40 bridges in Europe have been built on the Cruciani centering, and patents have been applied for in this country.

### CURB YOUR COSTS

on Curb and Gutter Jobs Street Forms

The BLAW-KNOX "Complete Package" of STEEL UNIVERSAL STREET FORMS

meet any cross section requirements and every construction specification









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Self-aligning road forms save time and materials on highway and airport paving, too. They will assure rapid form setting that is always true to line and grade. Road forms are available in heights of 8" or more and Airport forms in heights of 12" or more.

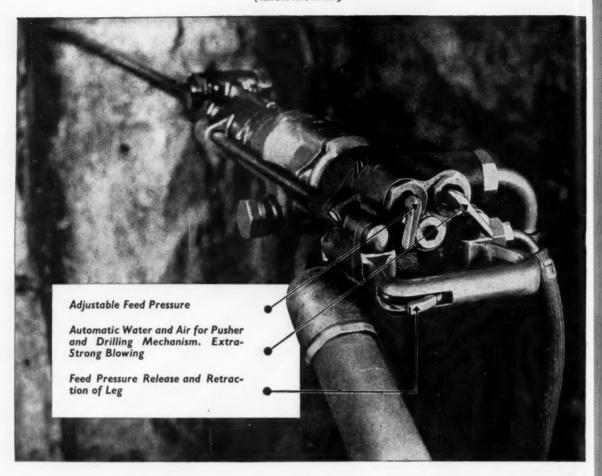


YOU can cut forming costs in half and be set to take on a wide range of curb and gutter jobs with one set of Blaw-Knox Universal forms. One "Complete Package" of these forms handles every concrete curb, curb and gutter, integral curb or sidewalk job from simple straight work to curved and serpentine shapes. They are standardized and completely interchangeable so you can do the most work with the smallest investment in forms. They are fast and easy to set or strip, and practically eliminate hand finishing. The need for expensive carpentry and costly single-use materials is eliminated, too. Your Blaw-Knox distributor can give you complete details—see him today.

### **BLAW-KNOX COMPANY**

CONSTRUCTION EQUIPMENT DIVISION

38 Charleston Avenue, Mattoon, Illinois



# RETRACTABLE LEG AND ONE-HAND GRIP-CONTROLS SPEED DRILLING TIME

For years Atlas Copco have been the world's largest manufacturers of pusher leg drills. Since 1937 when Atlas Copco, far ahead of any other manufacturer, introduced their first pusher leg drills, they have continuously improved the design of these drills. Their latest development, the Atlas Copco 'Lion', combines an unequalled ease of operation together with a high drilling rate—both contributing to a higher footage per manshift.

#### All controls under one hand

The Atlas Copco Lion is the first drill to have all the valves which operate the drill under the control of one hand. Full control without having to move the hand from the backhead!

The valves are all easy to operate. By the use of only the fingertips the drill can be started or shut off, the feed can be adjusted to the pressure required, or retracted for an advance, and the extra air-blowing can be brought on to clean the holes. T

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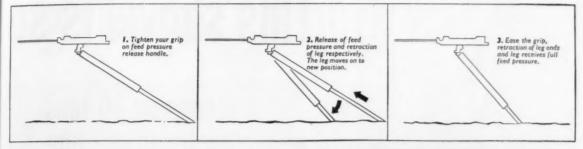
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All the control handles have been designed in such a way that they are well protected. While using them the operator's hand is never near the wall or roof of the drift. The Lion is the first pusher leg drill with controls placed for drifting.

#### Retractable leg saves time

When the leg has to be moved the feed pressure is easily released by squeezing the hand grip. By further pressure on the grip the leg retracts automatically.

#### Pusher leg moves forward with drill in full action



When the leg is in the new position suitable for continuous drilling, retraction stops and the feed pressure comes back by loosening the grip of the hand. All this can be done while the drill is still running.

This new idea of a retractable leg enables quicker repositioning of the leg and reduces the number of steel changes, thereby increasing footage per manshift. When drilling high holes it is now far easier to alter the position of the leg more frequently in order to maintain an optimal feed angle and feed pressure.

#### Packed with power for deep holes

The Lion has a drilling rate at least 30% higher than other rock drills of the same weight. Furthermore, it is designed so that it can maintain its high speed even when drilling deep holes. This means quickly drilled deep hole rounds and a faster, steadier advance. You'll also find that the Lion reduces to a minimum the gauge wear of the bits in abrasive rock. And owing to the ease with which the feed pressure is released and brought back into action, the Lion is a handier drill to work with in fissured rock.

#### Sandvik Coromant -the right steel for the Lion

All Atlas Copco drills—and this goes for the Lion—have been developed from the earliest stages with Sandvik Coromant tungsten-carbide-tipped integral steels and detachable bits. No drill or steel developed separately could ever give such equivalently high performances as this drilling combination. It is today the most widely used in the world, responsible for drilling more than one billion feet per year.

Free Demonstration! Wire, 'phone or write today to any one of these offices and see the Atlas Copco Lion in action for yourself.

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Without changing the grip of the hand the driller can easily position and control the machine, saving time and reducing fatigue.

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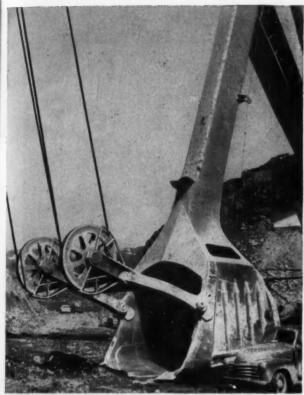
# This shovel is so

# It scoops up 90 tons of overburden in one bite

THE MOUNTAINEER, "world's largest shovel," built by Marion Power Shovel Company for Hanna Coal Company Division of Pittsburgh Consolidation Coal Company.

CHAMPION WEIGHT LIFTERS. It takes only two 2½-inch Tiger Brand hoist ropes to transform the power of this huge machine into useful work. The boom is supported by four 3½-inch Tiger Brand Bridge Strands.

# big you can't believe your eyes





THE BIG DIPPER can scoop up 60 cubic yards of overburden, deposit it 290 feet away in piles 100 feet high. Tiger Brand Wire Rope provides the steel "muscles" that make it work.

You have to look at this shovel with your imagination—for your eyes will surely deceive you. The tip of the boom, for example, rises up as high as a 16-story building. The shovel has the power to lift a platform containing 166 1½-ton automobiles 100 feet into the air, swing them the length of a football field, set them down on top of a 10-story building, and swing back for another load . . . all this in 45 seconds!

The tremendous power of the shovel is transmitted to the dipper through two  $2\frac{1}{2}$ -inch American Tiger Brand Wire Ropes, each 580 feet long. The huge boom, which towers 160 feet, is supported by four 115-foot lengths of  $3\frac{1}{2}$ -inch diameter Tiger Brand Galvanized Bridge Strand. Each strand has a breaking strength of approximately 800 tons, for a total of 3200 tons.

In addition to the main hoist ropes and boom supports, the three-man elevator shuttles up and down on standard Tiger Brand Elevator Wire Rope.

The fact that all of the wire rope applications on this "world's largest shovel" are being handled by standard Tiger Brand constructions emphasizes the quality of the engineering that goes into the complete line of Tiger Brand Wire Rope. No matter how big and exacting the job, you can get a Tiger Brand Rope to fit your needs.

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### **USS AMERICAN TIGER BRAND WIRE ROPE**



-Excellay Preformed-

UNITED STATES STEEL



CONCRETE CHUTES fan down from two corners of job enabling several transit-mix trucks to be unloaded at the same time. Job is

a New York housing project where bad ground conditions forced substitute of pressure slab for regular foundation.

# **Big Saturday Pour Goes Fast**



CRANES SPOTTED on corners opposite the chutes help speed pour by making possible the unloading of additional trucks.

EVERBODY connected with the job had a good payday that Saturday-contractors, concrete suppliers, and laborers alike.

New York contractors George F. Driscoll Co. and Moccia Construction Corp. found themselves with an easy extra. Ryan Concrete Corp., the supplier, sold 1,500 yd of concrete on a day its plants normally would be shut down. As for the laborers, they got themselves a day's pay at time and a half.

What brought this happy situation about was a bad ground condition that turned up unexpectedly during excavation of the foundation for a 16-story unit of the Senator Robert F. Wagner, Sr., Houses in Manhattan. The shovel doing the digging struck water forcing a substitution of a 5-ft-thick pressure slab for the conventional foundation designed for the job.

Preparing the pour required careful planning. Ryan was to use two plants to maximum capacity along with 20 trucks to deliver concrete at a rate of just under 300-yd-per-hr. Any traffic snarls on the job figured to prove costly.

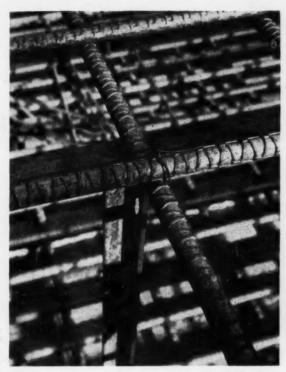
The foundation—shaped somewhat like a letter "T" -measured approximately 64x144 ft. To prepare for placing the pressure slab the contractors wellpointed

Page 112 — CONSTRUCTION METHODS and Equipment — February 1957

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UPRIGHT CHAIR stood vertically on mudmat holds slab's top reinforcing securely in place against buffeting of concrete.



METAL LIP—about 8 in. wide—welded over feed top of 2-yd Insley bucket increases its concrete handling capacity by  $\frac{1}{2}$  yd.

the area dry, then put down a 3-in. concrete mudmat with 3x3-in. curbs built into it on 11-ft centers to serve as chairs for reinforcing steel. Simple plywood panels braced against embankments served as forms around the slab's perimeter. Bottom reinforcing bars next were placed.

To support top reinforcing and protect it against the impact of the concrete during the pour, the contractors contrived handy vertical reinforcing chairs. These were made from 4-ft sections of 2-in. angle iron placed vertically on the mud mat on 6-ft centers and held securely in place against bottom reinforcing by tie-wires. Bars span the chairs holding them rigid.

To avoid traffic trouble during the pour, job superintendent James R. Thorkildsen devised a neat, twocrane, eight-chute pour that worked fine. Thorkildsen spotted two Lima 802's on diagonal corners of the job and fitted them with 2-yd Insley buckets. He welded steel plates over the bucket feed tops thus increasing their capacity by half a yard each.

The chutes were made by tacking galvanized sheet metal to 3x8-in. timber frames. Chutes were spotted on corners in clusters of four opposite the cranes. Thus, as trucks arrived on the job they had available to them for dumping the two cranes and the eight chutes.

Promptly at 7 am, four Ryan trucks were on the job ready to start unloading concrete. Between 7 and 1:30 pm, a steady stream of trucks appeared, unloading concrete at a near 300-yd-per-hr clip. It was a good day's work. To celebrate, Driscoll knocked his men off at the pour's end with a full day's pay.



CONCRETE is deposited close over reinforcing steel to lessen impact of discharge. Wood template (bottom) spots column dowels.



#### NEW! FRONT END LOADER

Here's the latest addition to the 105 wide-range family of rugged earth-moving tools.

In loading applications where physical and haulage conditions make its use more practical . . . here is a front end loading mechanism that gives you extra strength for the most severe job.

#### Bulldozer

Dozer blade attachments are designed to make full use of the extraproduction features of the 105. In broad usages such as cutting haul roads for logging outfits . . . pioneering in shale and hard rock . . . clearing fire paths for the Forest Service . . . the Eimco 105 Bulldozer has proven its high-capacity ability the world over.



Large, double-acting hydraulic boom cylinders provide ample power to hoist loads weighing up to 15,000 lbs. to full height. Boom and bucket controls may be operated simultaneously.

To fill the big (2½ yard) bucket, this loader develops 25,000 lbs. digging force at the lip. 40,000 lb. pry-out force and 40 degree bucket tip-back at ground level gets full bucket loads, minimizes spillage. It carries loads close and low for maximum stability.

It operates in 9' 6" headroom . . . discharges into haulage units up to

Exclusive features of the hydraulic system provide an extra margin

All attachments are Eimco-built to standard SAE mounting dimensions for the basic 105 Tractor. This means extra performance from every attachment through independent track maneuverability . . . up front visibility . . . power shift operating ease . . . balanced design for maximum stability . . . quality built for dependable on-the-job service.

of protection against mechanical delays.

#### **Excavating Loader**

Where digging is extra tough . . . and haulage provisions can be adopted to take full advantage of overhead discharge — the time-proven 105 Excavating-Loader will give you bonus loading power at the bucket lip and bonus dumping speed to accelerate the entire cycle.

Unique contour of the rugged rocker arms . . . bucket design and smooth, steady flow of engine power transmitted to the bucket lip through the torque converter gets 39,200 lbs. of digging force right where you want it . . . in the pile. Awkward maneuvering to get into dumping position is eliminated in ideal overhead discharge applications.



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BIRD'S EYE VIEW OF A BONE DRY HOLE

Two-stage MORETRENCH WELLPOINT SYSTEM keeps 38' of water well below subgrade on pump station in Sayreville, New Jersey. Material—fine to coarse sand and clay. For expert pumping—at a saving—get Moretrench on your job! For full details, call our nearest office.

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Rex Moto-Mixers, in all standard sixes...the industry's leader in carrying capacity and combined speed of charge, mix and discharge.



Rex Building Mixers, rugged...efficient ...designed for one-man spotting and easy hitching and towing. Capacities from half-bag to three-bag.

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Rex Railporter, for concrete and bulk materials placement...runs self-propelled and unattended on a single portable rail.



Rex Pumpcrete, pumps concrete through portable pipeline...transports, elevates and places concrete in a single economical operation.

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Rex Self-Priming Centrifugal Pumps, capacities from 4000 to 90,000 g.p.h...wheel or skid mounted...powered by gasoline engine electric motor or diesel engine. The pumps that never let you down.

Rex products for concrete mixing and placement are designed and built to the "leader-ship" standards of CHAIN Belt Company. The creative abilities of Rex Engineers are working constantly to develop new and improved products for the construction industry.

Rex features are often imitated. Rex quality and performance are never equalled.

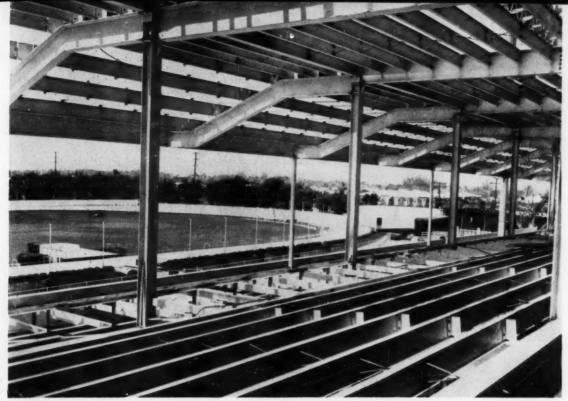
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MOTO-MIXERS . BUILDING MIXERS . PUMPCRETE . RAILPORTER . PUMPS



LIGHTWEIGHT BEAMS bolted to upright T-flanges welded to supporting beams cut time of erection in half of grandstand at Miami's

Biscayne Kennel Club racetrack. Beams next will be covered with a 21/2-in, concrete slab poured over corrugated steel sheets.

# **T-Flanges Connect Steel Joists**

T-FLANGES make fine time and money saving beam connectors.

Using them to tie together lightweight steel joists on a new grandstand for Miami's multi-million-dollar Biscayne Kennel Club dog track, a contractor cut his normal steel erection time in half.

And for Ludman Steel Co. of Miami, time was an important factor in the job. Greyhound racing at the track is seasonal. The old grandstand—in operation since 1926—had to be torn down and a new one built during the fourmonth interval between racing meetings.

Ludman had just a little over a month to place some 940 tons of structural steel; 194 tons of this was to be Jones & Laughlin's lightweight Junior Beams that would serve as floor joists on all three levels of the grandstand.

Demolition got underway shortly after the racing season ended. Foundations were placed, and Ludman began erecting steel for the 280-ft grandstand. The contractor used two cranes and a crew of 30 men.

In order to adapt the joists to bolted connections, Ludman cut standard 5-in. T-flanges into 9-in. lengths to serve as beam supports. These were welded upended on top of the regular wide-flanged supporting beams after two 9/16-in. holes first had been punched on 4-in. centers of each upright T-flange.

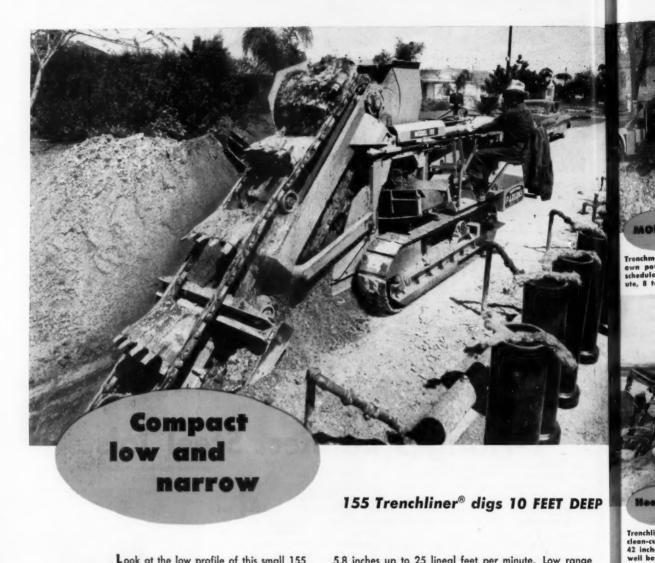
Matching holes had been punched into the ends of the webs of the lightweight joists. It was a simple matter, therefore, to place the joists into position atop the beams and bolt them securely to the T's. Bridging at ½-in. rounds next was welded in two rows between joists.

"Time savings were tremendous," said Harley Delph, president of Ludman. "The Junior Beams were so light they could be positioned by hand. Using them, we were able to fabricate and erect floor joists twice as fast as more conventional joists. Total erection time for the grandstand was less than 30 days."

Joists were placed on 2-ft centers in 20-ft bays. Steel forms were placed over joists. Mesh followed and then a 2½-in, concrete slab.



BOLTING lightweight joist to T support is done with an electrical impact wrench.



Look at the low profile of this small 155 Parsons Trenchliner! Working height is only 7 feet-4 inches. This lets it dig under trees, overhanging branches and other overhead obstructions where larger trenchers can't go. Width over crawlers is only 5 feet-4 inches for work and travel between buildings, in narrow alleys, and other restricted operating areas. Close side-clearance puts trench within 21 inches of walls, poles, fences. Spoil conveyor dodges side obstructions without swerving from grade-line — shifts through machine by power in less than 1 minute. Belt direction is instantly reversible, places spoil bank on either side of trench.

For all its compactness, this utility-size 155 offers a big "plus" in work capacity. It digs 16 to 26 inches wide -10 feet deep. You get 30 digging speeds (60 optional) from

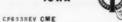
5.8 inches up to 25 lineal feet per minute. Low range lets the 155 "inch" its way past cross-pipes, through rock and other underground obstructions. High range gives maximum feet per minute on cross-country trenching.

Sloping ladder-boom undercuts walks, curbs, gutters, makes vertical set-ins flush with main lines or foundation walls. Positive down-crowd with hydraulic control starts cut fast, maintains accurate grade. In fact, this 155 has all the heavy-duty characteristics of larger Parsons Trenchliners. It has cast-steel buckets, "Tap-In" teeth, spring-cushioned bucket-cleaner, enclosed gearing, tractor-type crawlers with 16-inch grouser treads or 12-inch flat shoes, choice of gas or diesel power. Have your Parsons distributor demonstrate what this new 155 Trenchliner can do for you — call him today.

Vant	more	facts?	Send for - spec. sheet	☐ bulletin on 155 Trenchliner
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#### PARSONS DIVISION

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KOEHRING COMPANY



Parsons rubber-tired 88
Trenchmobile® drives job to job under its
own power at 12.6 m.p.h. — maintains fast
schedules. Digs 14½ feet of trench per minute, 8 to 16 inches wide; depths to 5 feet.



This general-purpose 250 Trenchliner produces up to 9½ lineal feet of clean-cut trench per minute. Widths, 16 to 42 inches. Depths to 12½ feet. Discharges well beyond edge of trench, or loads trucks.



Equipped with single digging boom, Parsons 310 Trenchliner excavates 17 feet deep, 1½ to 4½ feet wide. With dual booms, it digs 6 feet wide, 12 feet deep - speeds installation of largest sewers, mains, transmission systems, footings. Parsons wheel-types also available, including "big-inch" and "middle-inch" Trenchliners.

#### Get 3-tool versatility with Kwik-Mix Moto-Bug®

Big R-15 Moto-Bug hauls all kinds of bulk materials in 15 or 18-cubic foot hopper body. Hopper is quickly interchanged with 1-ton capacity platform, or ¾-ton (7-foot) fork lift. There's no limit to its usefulness — earns big savings in time and costs. Ask, too, about smaller S-10 Moto-Bug, available with multiple attachments. Kwik-Mix line also includes concrete mixers, plaster-mortar mixers, bituminous mixers — all sizes and types.

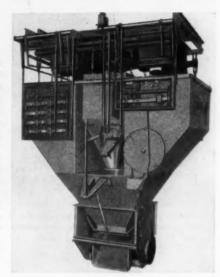
KWIK-MIX · Port Washington, Wis. (Koehring Subsidiary)



### Central cement feed prevents "gumming"

With concentric arrangement of aggregates around cement in the Johnson Concentric Batcher, all ingredients are intermingled as they flow through discharge. Reduces dusting, pre-shrinks materials. Cement is weighed individually on precision-beam scale; aggregates on accumulative dial scale or individual beam scales. Johnson Concentric Batcher sizes: 2 to 8 cu. yds., arranged for 2 to 8 aggregates, 1 to 4 types of cement.

C. S. JOHNSON · Champaign, Ill. (Koehring Subsidiary)



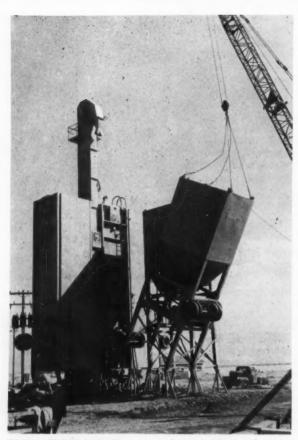
# Compare Koehring 205 with any other ½-yard

Crowd, swing, boom-hoist and retract clutches on Koehring heavy-duty 205 are among the largest used in the ½-yard class. Powerful cable crowd and electric push-button dipper trip maintain fast dig-and-dump cycles. Automatic traction brakes simplify operation, lock and hold the 205 when working or parked. Work capacity: ½-yd. shovel or hoe; ½ to ¾-yd. clamshell or dragline; 10-ton lift crane on crawlers; 15-ton truck crane.

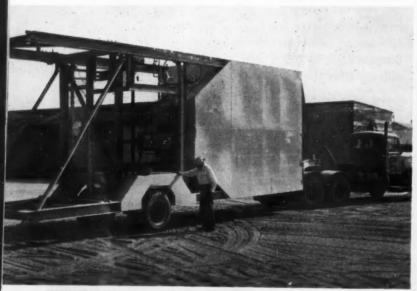
KOEHRING Company Milwaukee 16, Wis.



## Plant Travels on Its Own Wheels



CRANE LOWERS double-bin aggregate hopper into horizontal position for moving. Each unit of batch plant travels on built-in wheels.



TRUCK TRACTOR prepares to haul one of plant's two aggregate hoppers to a new job location. Other wheeled components include a 500-bbl cement silo, an elevator, and base.

A BATCH PLANT that can be knocked down in a matter of hours and then hauled along the highway on its own wheels is supplying dry mix for several Morrison-Knudsen Co. concrete paving jobs at Air Force bases.

The plant carries its own builtin source of mobility. Each of the seven units that make up the plant can be towed along the road on its own wheels without exceeding state highway department limits on load or dimensions. When the plant is disassembled and ready to travel, none of its components is higher than 13½-ft.

The Morrison-Knudsen plant consists of three 500-bbl cement silos, a cement elevator, two double-bin aggregate hoppers, and a supporting base that does away with the necessity of preparing an elaborate foundation.

Morrison-Knudsen uses a crane to lower the components to a horizontal position. Each component is then hooked to a truck tractor and towed along the highway to the next job, where another crane assembles the plant.

The plant was designed for Morrison-Knudsen by the Idaho Sprocket and Machine Works, Inc., of Boise, Idaho. It is expected to be the forerunner of a line of small and large capacity units that will sell for about \$110,000, depending on the capacity desired.

Morrison - Knudsen used the plant on two paving projects at the Strategic Air Command Base at Mountain Home, Idaho, and on an Air National Guard job at Gowen Field, Boise, Idaho. On the Gowen Field job, which involved the extension of concrete parking ramps, the plant poured 140 yd per hr. Capacity was limited, according to Morrison-Knudsen, because the plant couldn't be supplied fast enough. On the Mountain Home jobs, the plant delivered from 170 to 180 yd per hr. The manufacturer rates the plant at 200 yd per hr under ideal conditions.

One man operates the plant through a series of electronic batching controls manufactured by the Hardy Scales Co. of Maywood, Calif. The M-K plant is strictly a dry mix batch system, but the manufacturer claims it can be converted easily into a transit-mix truck batching plant by adding a metered water line.

Use

CLAY ON compactin and some Michigan. TORS wer satisfactor this partie

THIS K-45 pacting fil job. There sity specifi self-propel contractor paction pe

specification construction PACTOR. are shown photos of the material

# How to meet density specs \( \begin{array}{c} \line{\text{in fewer passes}} \\ \text{at less cost} \end{array} \] Use the BUFFALO-SPRINGFIELD K-45 KOMPACTOR



CLAY ON PLANT SITE—One of 3 KOMPACTORS compacting nearly 90 acres of clay with some sand and some muck pockets on a plant site near Novi, Michigan. The contractor said that the KOMPACTORS were the only machines that would do a satisfactory job of compacting the clay found on this particular job.



CLOSE TO CULVERTS—The K-45 eliminates hand tamping on culverts such as this. On this one contract, 6 concrete box culverts in 12.726 miles of highway made close compaction a necessity. The KOMPACTOR also averaged 1100 yds. an hour on banked material—due to faster speeds and more uniform compaction, replaced other equipment.



"AN INSIDE JOB"—What other piece of compaction equipment could go inside the building and work right up to the walls? This self-propelled, reversible, highly manuverable K-45 KOMPACTOR is compacting the earthen sub-base over which the cement floor will be laid. No hand tamping required—time and labor costs greatly reduced.



THIS K-45 worked at speeds of 5 to 6 mph compacting fill fast on a Texas airport construction job. There was no difficulty in meeting 100% density specification . . . only 2 to 4 passes by the big, self-propelled, 32,000 lb. K-45 were required. The contractor attained 500 to 600 cubic yards compaction per hour.



SAVES AN OPERATION—One entire operation, running coral rock through a crusher for base meterial, was saved by the K-45 on a Florida air base job. The self-propelled KOMPACTOR followed a tractor and a rooter to meet density specifications. Such highly efficient operation is another reason for the K-45's wide-spread popularity.



"TURNS ON A DIME!"—comparatively. Because the K-45 KOMPACTOR is self-propelled and operates at fast speeds of 5 to 6 miles an hour either forward or backward with equal ease, it is highly maneuverable. Its turning radius can't be matched even remotely by tractor-drawn compaction equipment. Saves time. All compaction is downward.



RECORD COMPACTION time in meeting density specifications on a \$1,736,000 California highway construction job resulted from use of this KOM-PACTOR. Just what quick results were obtained are shown graphically by the two unretouched photos of the soil (right). The first soil photo shows the material, before compaction, on the Ventura-



Ojai, California road project. The second photo shows identically the same area after just 3 passes by the K-45 KOMPACTOR. (The pack of cigarettes in both photos is the same—see circles—and is shown for comparative size.) Fast speeds of 4 to 5 miles per hour by the self-propelled K-45 were maintained on this job.

● The K-45's "Interrupted Pressure Principle" of compaction does a better, more uniform job—provides minimum displacement of loose materials either forward or sideways—directs all compaction effort downward—requires fewer passes.



BUFFALO-SPRINGFIELD Roller Division-Koehring Company SPRINGFIELD, OHIO

Write today for full information, or see your nearest Buffalo-Springfield distributor.



Two scaffolds..same cost, same age..but only one still erects fast-as-new because it's

## "SKIN PROTECTED" BY GALVANIZING

When we talk about erecting fast as new, we're talking about real cost savings for anyone using scaffolding. The painted scaffolding on the left shows the rust and pitting which make it slow to erect. The unrusted scaffolding at the right shows no rust and pitting even though it has been used on construction jobs for two years. It is rust-proofed Universal Ezebilt—the only dichromate galvanizing gives a lasting 'skin protection' in the form of a smooth, lubricative coating, virtually eliminating

rust and making scaffold assembly trouble-free. Years after you get your Universal Ezebilt scaffolding, it will erect fast-as-new. Panels slip on and off coupling pins without binding. Braces are easy to insert and remove. And . . . it will look better on the job.

And remember, only Universal Ezebilt offers swivel-action "Gravity-Lock". construction—no nuts, no bolts, no loose parts. When next you order scaffolding, be sure to specify the finest—specify Universal Galvanized.



"YOUR
SCAFFOLDING
NEEDS
SKIN
PROTECTION
TOO"

Local sales and rental stocks in all principal cities Consult classified directories for your Universal Distributor

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the only GALVANIZED SCAFFOLD

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Page 122 — CONSTRUCTION METHODS and Equipment — February 1957

# PRESTRESSED CONCRETE...

#### **A Construction Methods special report**

By ALBERT C. SMITH Associate Editor

n only a few years time, prestressed concrete has attained the status of an industry.

No longer considered a mere substitute, it is a keen competitor of many conventional structural materials. It is no cure-all or panacea, but in many situations it has very definite advantages.

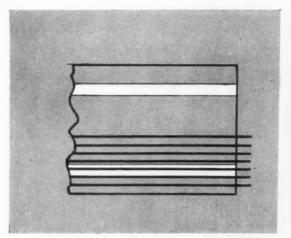
On medium-span bridges, for instance, prestressed concrete is fast becoming the standard design of many highway departments. And for good reasons. Prestressed girders or deck sections can be mass-produced quickly and erected without falsework. They require less maintenance, take heavy loads, and, most important, cost less.

On buildings, applications are limited only by the imagination of the architect and engineer. Prestressed components are now serving as roofs, floors, beams, columns, slabs, walls, and foundations. Besides a striking appearance, they feature durability, fire resistance, low maintenance, freedom from cracks, shallow depths, long spans, and—a big plus at the moment—immediate delivery.

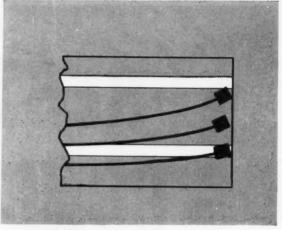
There are situations where prestressed concrete is not competitive, such as very short spans. And there are still problems to solve. Connections of precast members, for instance, are not completely satisfactory. Continuous designs of prestressed, precast concrete also await the solution of the connection problem. It demands above average workmanship, special know-how, and tender handling. You can't "slap it up" as you would a similar structure of convention construction. But used properly, it is a first-class structural material.

To bring you up to date on the fast progress of prestressed concrete in the United States, we offer the following three articles:

From Two Methods—A Variety of Applications 124
Commercial Prestress—New Market for Contractors 132
Pre-Tensioning Bed—Assembly Line for Prestress Products 138

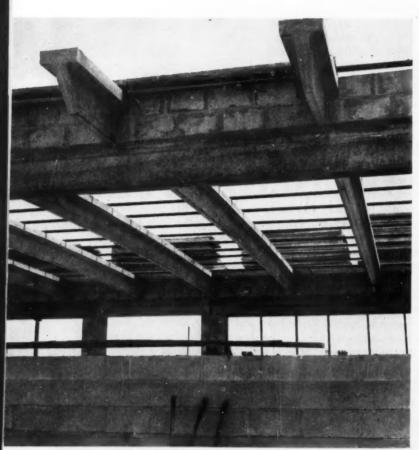


PRE- Strands are tensioned before concrete is poured, released after it sets.



POST- Draped tendons are tensioned after concrete sets, then grouted in place.

# From TWO METHODS-



T-JOISTS for school roof span 40 ft. Tectum is laid on steel subpurlins.

THERE ARE TWO TYPES of prestressing—post-tensioning and pretensioning. The older method, post-tensioning, is accomplished by tensioning steel tendons after the concrete has hardened. In pretensioning, the tendons are first tensioned against abutments. Concrete is placed around them, and when it hardens the tendons are released—prestressing the concrete.

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There is much debate about when to pretension and when to post-tension. Generally, jobs involving large numbers of similar medium-span components lend themselves to pretensioning. Long spans, those more than 70 or 80 ft, usually are post-tensioned more satisfactorily.

But it is difficult to generalize. Much depends on the proximity of competent fabricators. Actually, the pretensioned member is not as efficient structurally, but savings from mass-production often will dictate its use.

#### **New Developments**

Rather than an increase of one technique over the other, the future probably will see a combination of the two, especially for medium-length spans, to retain the advantages of mass production while offering high resistance to loads.



PRE- Mass-produced girders for Florida Turnpike bridges have striking appearance.



POST- Roof girders 120 ft long are posttensioned on school site and erected.

# **A Variety of Applications**

A more significant change already underway is the technique of draped or bent-down strands in pretensioned members. Hung in a vertical curve under tension, a strand creates compressive forces that act the same way in the beam as the tensile stresses from bending loads. It is very efficient structurally. The strands are draped by hold-down devices supported either above or underneath the forms. This new method will undoubtedly result in longer pretensioned spans.

Probably the most significant advances in post-tensioning are in new applications, rather than improved techniques. Post-tensioning now is applied successfully to long continuous bridge girders, lift slabs, runways, bridge abutments, cylinder piles, and many types of unusual columns and girders.

Today, there are three basic materials for post-tensioning—rods, cables, and parallel wires. There is much debate over their relative merits because there are many factors involved. The high cost of end fittings restricts the use of cables to very long spans. Bars generally are more expensive than wires, but field costs are less.

#### **Progress**

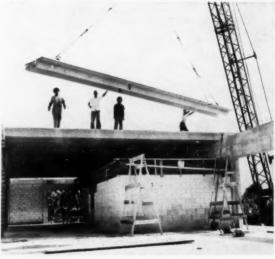
Pilot project of American prestressing was Philadelphia's Wal-



TWO METHODS prestress causeway. Slabs are pre-tensioned; piles are post-tensioned.



LIFT-SLABS are post-tensioned to reduce thickness. Freyssinet parallel-wire cables prestress slabs in both directions.



DOUBLE-TEE BEAM for roof of commercial building is lowered on to beams. Erection is fast. Roofing is applied to top surface.

nut Lane Bridge, a long-span posttensioned structure built about 1950. Post-tensioning reigned alone for two years until New York's Pier 57. This grandfather of mass-production prestressing proved the economies of the pretensioning method in the United States. And ever since, the trend has been in that direction.

Since Pier 57, both pre- and post-tensioning have gained rapidly—but in different ways. Post-tensioning operations have been set up primarily for specific jobs, whereas pretensioning has been taken over more and more by commercial fabricators. Of course, big jobs such as the Lake Pontchartrain Causeway have been turned out on specialized beds, but this is the exception.

#### Pretensioning

Pretensioning is the method that lends itself to commercial handling. And the rush to get in the business started right after Pier 57.

One of the first to get on the bandwagon was Concrete Products of America, Pottstown, Pa. This company was the first to switch from wire to strand, which, because of its superior bond with concrete, is now standard for the industry. The company's specialty is hollow, rectangular-shaped deck sections for bridges.

Although prestressing as an industry was born in the north, it took southern pioneers to give it the needed push. Florida, in particular, pushed the infant industry ahead. Its warm, year-round, climate, and its topographical features, are ideal for prestressed structures

The two men who sparked Florida prestressing are William Dean, chief bridge engineer of the Florida Road Department, and H. H. Edwards of Leap Concrete, Inc., Lakeland, Fla. Dean proved there is a substantial first-cost saving in prestressed bridges over structural steel. He experimented until he developed rigidly standardized designs for bridges. And today a number of competent Florida fabricators are equipped to produce standard beams at very low cost.

Leap Concrete, Inc., acted as technical consultant on most of the first casting beds set up in the south. They also worked with other pioneers, like Food Machinery and Chemical Corp., to develop universal steel forms. Cooperating with producers, suppliers, architects, and educators, Leap helped commercial prestressing over the big hurdles of three years ago.

Today, Florida is still the leader in prestressed concrete, but the rest of the country is catching up fast. An estimated 150 casting plants have sprung up to handle the wide variety of prestressed products now called for. And it is not unreasonable to predict that within a few years every major city will have at least one plant ready to turn out a wide variety of precast, prestressed units. As time goes on, more and more standardization will be adopted. Eventually, prestressed components will be ordered directly from a handbook.

The volume of prestressed business in 1955 was four times that in 1954. And last year it was nearly double 1955. It's anybody's guess how much bigger it will get.

It has the benefit of progressive thinking by a large fraternity of prestress devotees. And it gains new friends every day.

To help fabricators get started, and also to keep the older ones abreast of latest developments in prestress, a number of special consultants have come along. Besides Leap Concrete, there is the Freyssinet Co. of New York, which works with a family of fabricators on an affiliate basis. Freyssinet is a French firm that was a pioneer of prestressing. It was among the first to offer pretensioning consultation in this country.

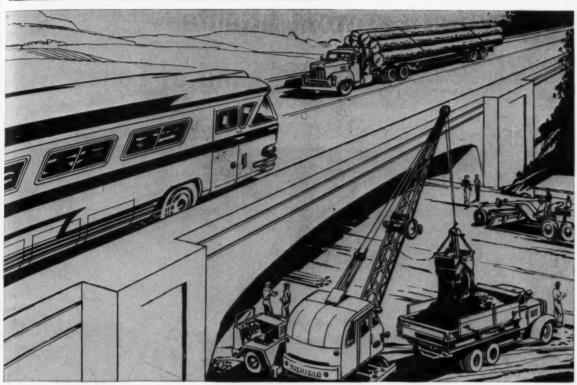
Among the other notables in the field are Charles Zollman of Philadelphia, Ross Bryan of Nashville, Tenn., Dr. T. Y. Lin of Berkeley, Calif., Preload Corp. of New York, Prestressing, Inc., of San Antonio, Texas, and several others.

Tensioning materials have been pioneered primarily by three companies—John A. Roebling's Sons Corp., American Steel and Wire Div., and Union Wire Rope Co.

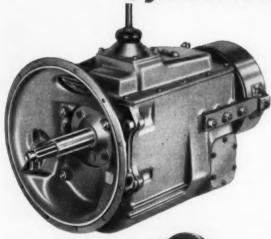
But there is still much to be done to advance the industry. The field is wide open for the manufacturer, engineer, designer, supplier, contractor, and fabricator with the courage and vision to accept the challenge.

Commercial Prestress— New Market for Contractors . . . on page 132

# Important Announcement by Clark Equipment



# ... A New CLARK 5-Speed Synchronized Transmission



Here's news vital to operators and builders of heavy-duty equipment—trucks, coaches, craneshovels, construction machinery.

This latest engineering triumph from powertrain headquarters is entirely new in every detail; and is equipped with the Clark Split-Pin Synchronizer proved dependable by millions of miles of heavyduty operation

Two basic models—both 5-speed, synchronized in 2nd, 3rd, 4th, 5th

300 V-Nominal torque rating 350 lbs-ft

400 V-Nominal torque rating 450 lbs-ft

For full information mail your inquiry to Clark Equipment Company, Transmission Division, Jackson 6, Michigan.

Transmission Division
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COMPANY

Falahee Road Jackson 6, Michigan



# from Atlanta to the Land of Lakes



VISQUEEN white opaque being placed on Minnesota Highway 169, south of Shakopes

Contractors everywhere have found the way to substantial savings in highway construction with VISQUEEN film.

Four mil VISQUEEN film in widths up to 32 feet is rapidly replacing other materials as a curing blanket. The reason? 80% less weight than other curing blankets—no absorption of water—lower first cost—many more reuses—concrete 10% to 19% stronger.

VISQUEEN provides quick protection for machinery and prepared roadbed when showers break—and there's no added cost. Keeps frost out of roadbeds on cold fall and winter nights.

There's nothing like VISQUEEN for curing concrete! Look at the proof,

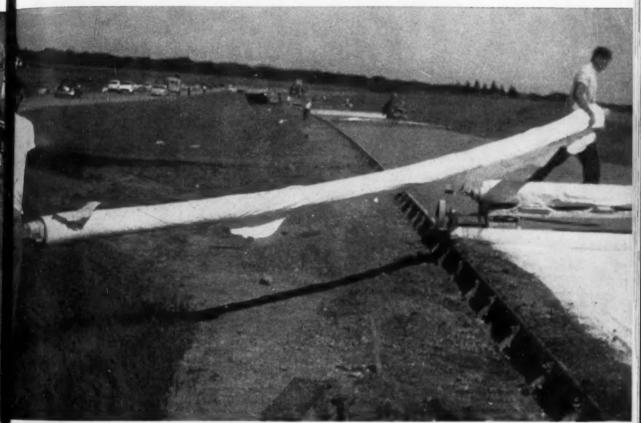
Here's why you will save important money when you cure with VISQUEEN film:

- 1. Much lower initial cost.
- Much less weight. Four mil VISQUEEN film weighs only one fifth as much as other widely used material. 1000 square feet weighs less than 20 pounds.
- Much easier to handle. Will not absorb water. 300 foot rolls 24 feet 4 inches wide can be unrolled and rerolled by two men. No time-consuming, costly drying needed.
- Much greater reuse. In Minnesota a 300 foot roll 24'4" wide was reused seventeen times. Contractor says he expects at least six more reuses.
- 5. Much stronger concrete. State testing laboratories compare cores from same immediate areas where white opaque VISQUEEN and a competitive material were used. In every case cores from concrete cured with VISQUEEN surpassed others by margins that ranged from 11% to 19%.

On High handle 3



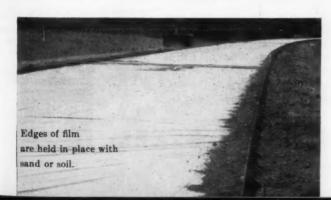
VISQUEEN film used as curing blanket on Atlanta expressway. Two men unroll it from steel pipes. After use, film is rewound on same pipes.



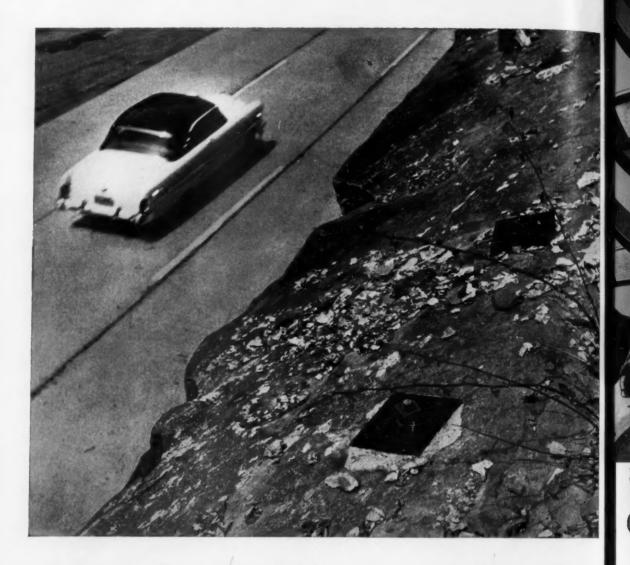
On Highway 169, south of Shakopee, Minnesota two men easily handle 300' roll of four mil white opaque VISQUEEN rolled on a 3''

wooden core. This piece of VISQUEEN was used seventeen times during 1956 road-building season—then stored for reuse in 1957.

# VISKING COMPANY Division of Union Carbide and Carbon Corporation PLASTICS DIVISION World's largest producers of polyethylene sheeting and tubing P. O. BOX 1410 TERRE HAUTE, INDIANA







# **Anchor Bolts Protect Traffic from Severe Rock Falls**

Here's an installation of Bethlehem Rock Anchor Bolts along a heavily traveled highway in eastern New York. The bolts, 1 in. in diameter and about 4½ ft long, lock together several layers of rock, making it virtually impossible for boulders to fall and endanger traffic.

#### Two Types of Anchor Bolts

Bethlehem Anchor Bolts are manufactured in two types, headed and slotted. Both can be furnished with a complete line of flat and angle washers, ties, and bolt extensions.

HEADED BOLT. Bethlehem's squarehead anchor bolt is  ${}^3\!\!/_4$  in. in diameter. It comes with rolled threads, and is used with a malleable-iron expansion shell. When the bolt is tightened in the hole, the leaves of the shell expand in four directions.

SLOTTED BOLT. This 1-in.-diam bolt is used with a steel wedge, started in the forged slot before the bolt is placed in the hole. When the bolt is driven against back of hole, the wedge is forced deep into the slot, expanding the bolt ends. Then the

nut is tightened on the threaded end, to develop the proper tension in the bolt.

If you would like to have full information about anchor bolts and accessories, plus installation procedures, just get in touch with the nearest Bethlehem sales office.

L. A. on

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation







#### M.S.A. BRIDGEMAN'S SAFETY BELTS

Designed and tested for dependability and comfort. Quick release type buckle. Special tonque arrangement prevents accidental opening. All hardware is drop-forged steel. Removable leather scabbard. Complete size range.



#### M.S.A. BODY-TYPE SAFETY BELTS

Flexible, rugged, yet comfortable on the job. Ideal for close quarters. Available in all three types of webbing. All Dee Rings are equipped with metal liners of 20gauge galvanized steel, All sizes,



# a single source for all your Safety Belts



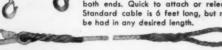
#### M.S.A. HARNESS TYPE WEB SAFETY BELTS

This type of belt gives extra body support, and the adjust-able shoulder straps distribute the weight more evenlyavailable in genuine leather or webbing.



#### STEEL TAIL LINE

Strong belt anchor made of light flexible steel cable with drop-forged snaps at both ends. Quick to attach or release. Standard cable is 6 feet long, but may be had in any desired length.



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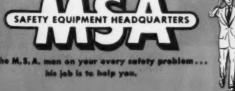
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Available in 1/2", 1/4" or 1/4" rope with drop-forged snap at one end, loop at other, or any combination required. All splices have four tucks, wrapped ends. Furnished in any length desired.





## backed by a single responsibility

Because there is no one safety belt that gives the best protection for every job, matching the belt to the need is all-important.

You get this selection advantage at M.S.A. Our complete line of safety belts lets you satisfy your specific requirements for safety belt protection . . . you get the belt that's built

You'll be interested, too, in the materials available. M.S.A. Leather Safety Belts are made from the highest grade harness leather, inspected and tested. Diamond-Stripe Webbing Belts are tough, yet comfortable, and are tested at 4,500 to 5,000 pounds. Straco Web Safety Belts have a tensile strength of 2,800 to 3,600 pounds. Both these materials are treated to resist moisture, mildew and the effects of paint. Neo-Web Belts, made of high tensile woven cotton webbing, and molded with a mixture of neoprene and special rubber, for chemical resistance, are tested at 2,800

special rubber, for chemical resistance, are tested at 2,500 to 3,200 pounds. All hardware on M.S.A. Safety Belts is tested to 5,000 pounds.

Get the facts on our complete line now. Our bulletin gives manufacturing details, describes and illustrates all M.S.A. Safety Belts. Write for your copy.

#### MINE SAFETY APPLIANCES COMPANY

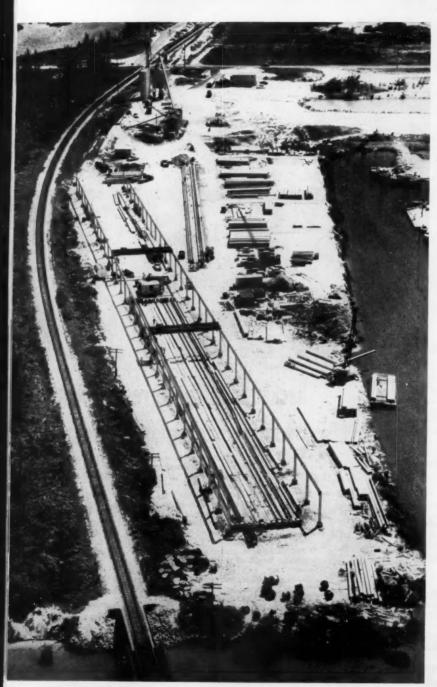
201 North Braddock Avenue, Pittsburgh 8, Pa.

At Your Service: 76 Branch Offices in the United States

#### MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED

Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S. Representatives in Principal Cities in Mexico, Central and South America Cable Address: "MINSAF" Pittsburgh

# COMMERCIAL PRESTRESS — New Market for Contractors



LONG CASTING BED at one of R. H. Wright Company's two plants in Florida is served by pair of P&H electric overhead cranes riding on 1,100-ft runway.

LOOKING for a new avenue of expansion? Want to get in on the ground floor of a rapidly expanding industry? Commercial prestressing may be just what you're after.

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But before you take the plunge, there are a few things you ought to be warned about. Don't go in with the idea of making a fast buck; it just won't happen. In fact, you'll probably have to work in the red for a good while. The reason is simple. You just won't find architects and engineers knocking at your door. Indeed, if you want to survive, you'll have to do a lot of door-knocking yourself.

Commercial prestress is a fascinating business. It's new and exciting. But nobody has yet made a "killing." And unless you enter the field with serious, long-range intentions, your chances of surviving are not good.

#### Fast Growth

Today, there are more than 150 casting yards in the country; a few years ago there were none. They range from simple one-bed affairs to impressive eight-bed yards fully equipped with overhead cranes, ready - mix plants, reinforcing shops, and all the other facilities that mark a first-class outfit.

As might be expected, most of these firms are owned by contractors who operate them as a separate and independent arm of the firm.

And that's the way it should be. A prestressing yard should not be just another service of the firm, to be used only if an opportunity presents itself.

"You're either in this business, or you're not," says Amos Rogers, president of Brann and Stuart Co. of Trenton, N. J. This old time bridge contractor is investing nearly \$2 million in a new prestressing yard. And they're in business to stay. They don't expect to make any real profits for the first few years, but they have enough confidence in the future to hold out until the demand for their products proves the soundness of the venture.

Backed by a reputation for quality and integrity, the 80-year-old firm is entering the field with the knowledge that, at least for the next few years, their big problem is promotion. Selling prestressed products depends on winning the confidence of architects and designers. And it's highly technical selling. The prestressed salesmen in many cases must act almost as a consultant to the highway official, designer, and architect. He must take the initiative, offer alternate designs, prove the economics of his product, stress its long term advantages.

In short, the successful prestressing firm must know all there is to know about its product. Unless it can handle design, fabrication, hauling, and erecting, it stands the chance of losing prestige for its product. Any time it allows an incompetent to handle a phase of the job, it invites trouble. Every failing of a new product, no matter how slight, gets magnified out of proportion and builds up into added resistance to the product.

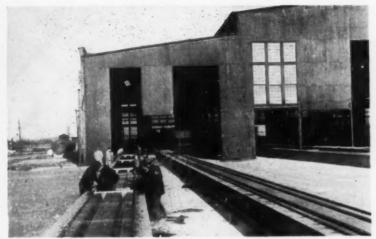
Commercial prestressing is a contractor's business. He knows concrete, and how to use it. He has imagination, know-how, resource-fulness, and, most important of all, the emotional makeup to take a risk.

Not that all contractors would make good prestress fabricators. It requires a special brand. He can't be nomadic in his operations; he must be geared to working a specified area of the country, and he must expect to stay there. Finally he should have at least \$200,000 to start with; three to five times that amount would be better.

For the entrepreneur in the prestressing business, the problems get pretty technical. What does it take to set up an efficient casting yard? Here's a gist of comments we gathered from the authorities in the field.

• Don't economize on property. Even though you'll want to start slow and grow as you pick up know how, give yourself plenty of room to expand. Remember, you won't always have a market for each day's production. A good size storage area is a must.

continued on page 135



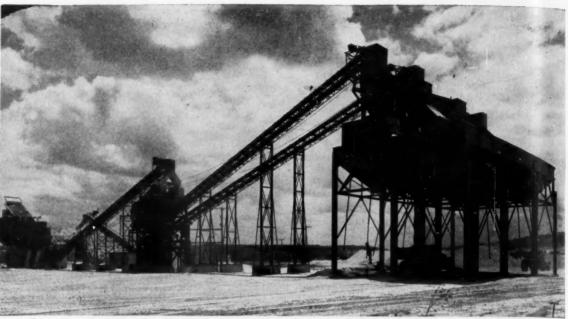
DOUBLE-TEE BED 400 ft long at Brann & Stuart's plant is ready for pouring.



JACKING CARRIAGES at Reid Contracting Company's bed overlook casting alleys.



REELS OF STRAND at Precrete yard in New York feed four universal casting alleys.



This is a complete Universal-engineered plant operating in the Limestone quarry of McDonnough Brothers, Inc. near

San Antonio, Texas. Of the Universal plant, Mr. McDonnough said, "We consider it the best engineered plant available".

# "600 tons per hour 100% passing 1½" screen

with our Universal 4650 Impact Master"

Says Mr. James P. McDonnough, president, McDonnough Brothers, Inc., San Antonio, Texas

"WE PURCHASED a complete Universal plant, including the 4650 Universal Impact Master for our limestone crush because we consider it the best engineered plant available. And we consider the Universal Impact Master the best operating crusher.

"We have, so far, produced 600 tons per hour of 100% crush passing 1½" screen with our Universal 4650 Impact Master. We have not yet come close to the capacity limits of our new plant, but

are confident that we are equipped to crush at least 800 tons per hour.

"In 1951 we purchased a Universal Impact Master (Model 3042) for crushings mainly in 7/16" size, for limestone used in asphalt and chemicals. Continuous operation of this plant for six years has given us an excellent opinion of the worth of Universal equipment and was a determining factor in our purchase of a complete new Universal-engineered plant this year."



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The Universal 4650 Impact Master. In-fed rock is reduced by a smashing blow from two rotor hammers turning in the same direction. Material moves forward and out by straightline action.

Aggregate producers everywhere look to the Universal Impact Master for top production in all types of material. It gives them more uniform gradation . . . top quality cubical aggregate with minimum wear and maintenance. Universal equipment is engineered for the rock crushing industry by men who know rock crushing equipment.

Write for complete information on the Universal Impact Master today.



### UNIVERSAL ENGINEERING CORPORATION

327 8th St., N.W., Cedar Rapids, Iowa

A Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division St., Chicago 51, Ilinois

#### PRESTRESSED CONCRETE . . . continued

- Locate your yard in or near metropolitan area. You won't ship more than a few hundred miles, so your local area must have enough activity to support you.
- Make sure there are no chemical plants nearby; their waste fumes can seriously harm stressing strands. And if you locate in a cold climate, an enclosed plant will give a big boost to your efficiency.
- Plan your casting bed for fast write-off. It's the heart of the prestressing plant. This is your assembly line—the place where ingenuity and efficiency play their most important roles. The point to remember is that this is a rapidly changing industry. Your bed could be obsolete in three years.
- You'll need a ready-mix concrete plant—or at least an ironclad agreement with a local supplier. A testing lab is not a must, but you'll want one if you're going in business the right way.
- Design your production with a definite hoisting system in mind. Don't assign your old cranes to the job. Or don't set up a loose system of calling upon any idle rigs waiting in the yard.
- Be flexible. Don't expect all your customers to pick up your products as they come off the beds. Prepare to haul prestressed units hundreds of miles from your plant. And know how to erect them when you get there. Check all types of transportation. It won't pay to limit yourself to only one method.
- Don't borrow key men for other duties and expect them to maintain a first interest in prestressing. Let your management grow with the industry.
- Try to keep a steady group of workers. Efficiency may be low at first, but through repetition, your men will soon develop needed skills.

If you need moral support, look to the pioneers in the industry. Commerical prestressing is not an untried venture. A number of companies have been in business from three to five years, and they get

bigger and better every year.

Probably, the firm that turns out the largest volume of prestressed numbers is R. H. Wright & Son of Fort Lauderdale, Fla. Wright received a big push two years ago when both the state and the Florida Turnpike Authority standardized on prestressed concrete for bridges.

Basically a road contractor specializing in southern Florida construction, Wright foresaw the tremendous potential of prestressed concrete in the state. He set up a prestress division and placed it under separate management.

To meet the huge demand for bridge and building units, Wright built two casting plants. He needed them fast because the Turnpike alone called on him for 40,000 linear ft of beams and 200,000 linear ft of piling.

Both plants have 1,100-ft casting beds serviced by overhead electric cranes. These main beds are equipped with eight casting alleys, which are probably the largest in the country. Wright assigns five alleys to beam casting, two to piles, and one to flat slabs.

Next to these main beds, the contractor has laid out several hundred feet of forms for pouring double-tee beams and joists. In any one day, Wright can produce about 400 ft of beams, 850 ft of piles, 430 ft of flat slabs, and several hundred ft of double-tees and joists.

Although most of Wright's business has been devoted to bridge members, the emphasis is now swinging toward the building market. And it will probably continue to move in that direction. Wright keeps an aggressive staff of sales engineers busy calling on architects and designers in the Fort Lauderdale area. They have to. It takes a lot of promotion to get an architect to accept a new product. But Wright has already left his mark in the area. Many types of structures ranging in size from small stores to huge industrial buildings have been built with his products. And his yearly volume is well into the millions.

Wright's success is being duplicated in many other parts of the country. And the potential is great. For the right type contractor, it's a market that's hard to beat.

Pre-tensioning Bed-Assembly Line for Prestress Products...on page 138

# An Index of PRESTRESSED PRODUCTS

- I-BEAM—Popular shape for floor, roof, or bridge girders where medium to long span is required and depth is not important. Used as separate unit, or in composite construction.
- WIDE-FLANGE BEAM—
  Same application as I-Beam,
  except it is superior on long
  spans with very heavy loadings. It is also desirable
  where depths are restricted.
- MODIFIED-I Best application is on bridge girders where deck acts as composite unit. In this case, stirrups are extended into slab to provide shear connection.
- HOLLOW SLAB Ideal unit for bridge construction where fast erection and minimum deck depth are most important. Placed side by side, they simplify surfacing.
- DOUBLE-TIE Most popular unit for roofs. Contains beam and slab in one unit. Spans up to 60 ft. Insulation and roofing are applied directly to smooth top surface.
- CHANNEL—Cast like doubletie, but has no cantilever. Takes heavier loads. Excellent for bridge and building floors. Large area is covered per unit.
- PILES Square or octagonal, solid or hollow, prestressed piles are superior to reinforced piles because they can take more handling abuse, and eliminate shrinkage cracks.
- JOISTS T-shaped unit is popular in structures with exposed ceilings. It has striking appearance. However, competition is keen from similar precast units that are not prestressed.
  - FLAT SLAB Resembling tongue and groove planks, these members are relatively new to the industry. They are ideal for small span roofs where headroom is α prime factor.

For heavy-duty special equipment and truck application...

# TDA' NOW OFFERS

today's broadest range of

# PLANETARYAXLES

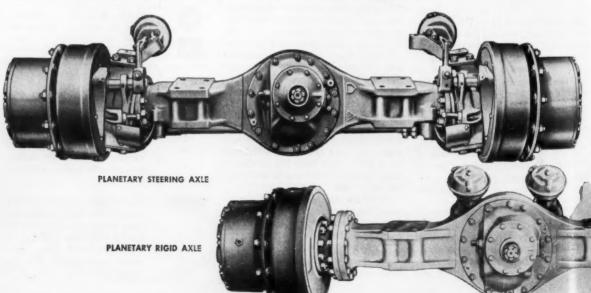
steering and rigid...from 11,000 to 75,000 lb. capacities!

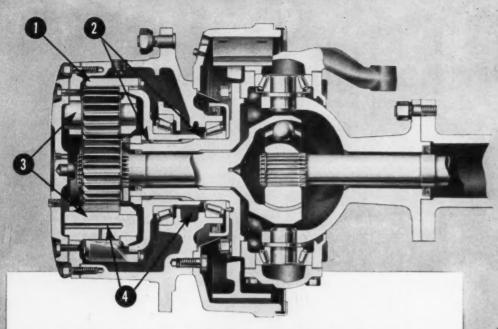
A complete range of new planetary heavy-duty axles—with a steering axle operationally matched to each rigid axle in the line—is now included in the Timken-Detroit® family of advanced design axles. This matching of steering and rigid units brings you just the right axles for every requirement in both special off-the-road equipment and heavy-duty trucks.

Years of research and development have resulted in these new and exclusive planetary OUTER-END features: floating ring gears—concentrically

mounted ring gear hubs—full-flow lubrication of all bearings and planet gears—special forged bronze planet pinion pins—and an unusually high degree of parts interchangeability.

Because of their versatility, ruggedness and almost unlimited gear reductions, these new, full planetary axles are going into use all over the world on heavy-duty prime movers, big four-wheel tractors, off-road rock wagons, mining equipment, heavy-duty scrapers, front-end loaders and other heavy-duty equipment.





# Only New Timken® Full Planetary Design Brings You These Features for Extra-Long Life, and Extra Dependability:

- 1. New Floating Ring Gear . . . Ring gear and hub are two separate pieces. Ring gear is free to float radially. This feature, combined with floating sun gear, assures equal distribution of stresses to all planetary gears, gives longer, trouble-free gear life.
- 2. Concentrically Ground Ring Gear Hub and Spindle Mounting Surfaces... Concentrical grinding around a common center assures perfect alignment and fit—plus freedom from bending forces on the hub and spindle splines. Splines absorb only torsional stresses from the ring gear and transmit them to the housing.
- 3. Special Forged Bronze Planet Pinion Pins
  ... Pins are forged of special alloy bronze
  for longer, trouble-free operation. Rifle
  drilled lubrication channels and machined
  lubrication flats assure full time lubrication of the planet pinions. When cover is
  assembled pin is locked in place to prevent rotation—resulting in longer pin life.
- 4. Full-Flow Lubrication... Design of Timken planetary axles assures constant flow of lubricants to wheel bearings and all planet gears while vehicle is in operation. Wheel hub and planetary spider pick up oil in the cast reservoirs as they rotate and channel it to wheel bearings and pinions. When vehicle is not in motion oil is retained in these chambers providing ample initial lubrication for all moving parts.
- 5. High Degree of Parts Interchangeability . . . Important to service and operation is the high degree of parts interchangeability between both rigid and steering axles in the same planetary series. This means a smaller parts inventory, low maintenance costs and more productive time with Timken planetary axle equipped vehicles.

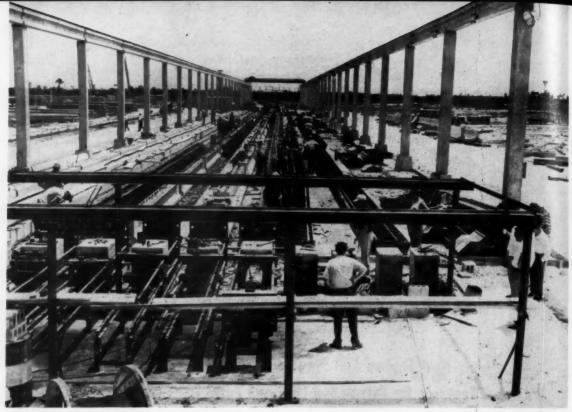
Plants at:
Detroit, Michigan • Oshkosh, Wisconsin
Utica, New York • Ashtabula, Kenton
and Newark, Ohio • New Castle, Pennsylvania

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For complete information on the TDA family of planetary axles—write Timken-Detroit Axle Division, Detroit 32, Michigan . . . or visit the TDA display at Booth No. 364 at the 1957 Road Show—Chicago Amphitheater, January 28th through February 2nd1



WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSSES AND TRAILERS



UNIVERSAL BED at R. H. Wright plant in southern Florida has Set up about three years ago, bed is perhaps the biggest producer eight casting alleys and handles many types of beams and piles.

in the country. Tensioning is by pull-rod arrangement.

PRESTRESSED CONCRETE . . . continued

# PRETENSIONING BED—Assembly

THE CASTING BED is the key to mass production prestressing. It governs the efficiency of the assembly-line and determines the quality of the product.

Flexibility and quality control are the key factors. A successful fabricator must be able to produce a variety of top grade prestressed units with a minimum investment in beds, forms, jacks, and handling equipment. Flexibility will result in some losses in efficiency, but it is essential to meet changing demands on the plant.

The new fabricator will do well to set up two basic types of bedsone for double-tee beams and the other for just about everything else. The latter is generally called a universal beam bed.

#### Double-Tee Bed

Bread and butter item of any plant is the double-tee. It is the closest thing the industry has to a standard product.

Forms for pouring the doubletee are a fabricator's dream. They never have to be stripped; the double-tee is simply lifted from the

Permanent steel forms for the double-tee cut costs to the bone. because they have maximum interchangeability. One double-tee form can produce 37 different castings. Besides a number of doubletee sizes, it can be modified to form channels, single tees, joists, and even bleacher seats.

Because it does not have to be stripped, the double-tee form can easily incorporate permanent curing fixtures. Steam is the conventional choice, but hot oil is now catching on because of its higher curing temperatures and reduced maintenance. To prevent high temperatures from creating surface cracks in the concrete, some contractors employ drip or sprinkler systems to maintain surface mois-

Because the double-tee is a smooth-sided unit, forms are made This permits any continuous. length beam to be fabricated in the form. Steel bulkheads can be inserted anywhere.

Average length of a double-tee bed is 300 ft to 400 ft. Under ideal conditions, it can turn out a set of beams every day. The shape of the beam lends itself to fast curing, it strips quickly, and takes little time to prepare for a new batch.

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Streamlining double-tee production, should be one of the first concerns of the new fabricator.

#### Universal Beam Beds

A universal bed handles beams, girders, piles, deck sections, and similar units. It can tension any strand pattern, whether it is low and wide or high and narrow.

An ideal bed is one that is about 600 ft long but has inserts or stub columns at the center for cutting the effective length in half if conditions warrant. Width of the bed depends on the number of casting alleys. And this varies greatly.

A bed has two major functions. It provides the flat base on which the units are cast, and its end anchorages maintain the tension in the strands until the cast members can absorb the stress.



TWIN DOUBLE-TEE BEDS can be modified easily to accommodate many sizes and shapes of beams. At left bed, workers cut strands so that beams can be removed from form.



LONG BEAM is easily stripped from bed with few tugs by Lorain truck crane.

### **Line for Prestress Products**

Most often, anchorages consist of very heavy steel beams sunk vertically up to 35 ft and embedded in concrete. Sometimes, a huge block of concrete will serve the same purpose.

The tremendous forces that pull on the anchorages during tensioning are sometimes transmitted entirely into the ground, but more often the bed itself is designed to absorb them. A bed 9 to 12 in. thick can resist huge forces from its end anchorages because it is completely supported on one side by the ground and acts as a braced column in compression.

#### Stressing Tendons

Standard tensioning element is the seven-wire uncoated stressed-relieved strand; popular diameters are \(^3\)/s in. and 7/16 in. Strand may be purchased either in coils or on reels. Coils contain about 3,000 ft of strand, but reels have nearly five times that length. The choice between coils and reels depends on the job. If the bed is set up for a specific job, coils mounted on a

swift car may eliminate some strand waste. If there is a large number of strands per pattern, and if the operation must be repeated often, coils on a swift car may have advantages. But for the commercial fabricator, the trend is toward reels. They are easy to handle, require less frequent replacing, and offer a more efficient setup.

A good casting yard should have a space reserved for storing reels. Strands rust easily, so reels should be stored on blocks and covered with tarps to keep out the rain. A certain amount of rusting will always occur, but this is not harmful. In fact, some authorities believe it improves bond with concrete.

#### **Reel Stand**

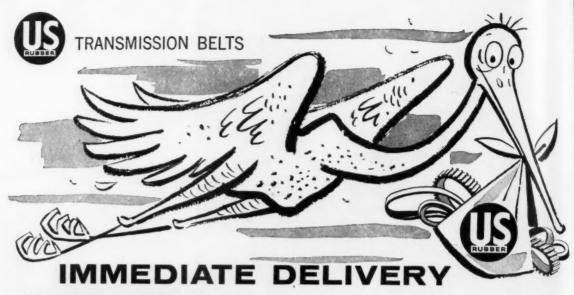
When supplying strand to the casting bed, reels are mounted in a stand at one end. An efficient stand mounts several lines of reels with at least four reels to a line. If the reels in each line are mounted so that the highest one faces the bed, strands can be easily pulled from the underside and de-

livered as a group. To eliminate any entanglement, strands are fed through fairleads at the front of the stand.

There are several methods of pulling the group of strands down the bed to the opposite abutment. Generally, the ends first are threaded through holes in a steel templet and locked with Reliable gripping chucks, now considered a standard tool for the industry. The holes in the templet are laid out in the exact pattern called for in the member to be cast.

When all strands are locked, the templet is secured on a dolly, sled, or similar device. Power winches at the opposite end of the bed pull the device, and the strands unreel.

There are several modifications of this basic method, depending on the type member to be cast. When continuous forms are used, it's a good idea first to thread strands through a bundle of bulkheads before locking them in the templet. In this way, the bulkheads are simply carried along with the strands and dropped off at the





The complete V-Belt line includes famous U.S. Rainbow®, U.S. Royal Super-Service, and fractional horsepower belts (made by the error-proof Electronic Tension method to eliminate vibration, increase service life).

### from a Complete Line

FLAT BELTS V-BELTS TIMING BELTS All Sheaves and Pulleys



"U.S." Flat Belts come in special cordconstructed endless lengths or in duck roll belting. "U.S." production techniques guarantee quality performance. "U.S." is really geared to deliver. You really get immediate delivery or shipment—thanks to your local "U.S." distributor backed by the strategically located District Sales Offices and transcontinental chain of warehouses. The "U.S." Transmission Line includes flat belts and belting, V-belts, sheaves, and Power Grip "Timing" Belts and pulleys for any power transmission need.

These belts, sheaves and pulleys—plus expert engineering assistance by power transmission specialists—are available at "U.S." power transmission distributors, any of our 28 District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.



The PowerGrip "Timing" Belt was awarded the Franklin Institute's 1955 Longstreth Medal-for "invention of high order." By providing near-100% efficiency in positive, non-slip, split-second timing, it has become standard equipment in a wide variety of machines and appliances.



V-Belt Sheaves and "TIMING" Belt Pulleys

are tested for static balance and engineered to deliver the high durability and efficiency that are built into every "U.S." Belt.





**Mechanical Goods Division** 

**United States Rubber** 

#### PRESTRESSED CONCRETE . . . continued

#### **How to Handle Strands**

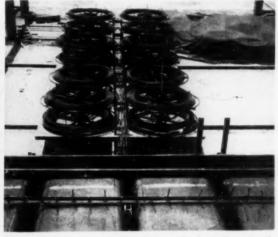


AIR HOIST OPERATOR watches signals from swift car at opposite end of bed as he pulls templet-carrying dolly to anchorage.



REINFORCING BARS are tied across tensioned strands, anchored to templet with Reliable double-cone-type grippers.





CONCRETE BLOCK handled by overhead crane draws group of SWIFT CAR mounts 10 spindles of strand. This method is primarily strands from reel stand and pulls them to opposite end of bed. for big jobs where consistent patterns can cut strand waste.

proper points. Sometimes it eliminates a tricky problem of fitting a bulkhead around tensioned strands.

The same method is advisable when casting spirally reinforced piles. Thread the strands through the spirals before locking in the templet, hang them on the dolly, and cut them off periodically as the dolly travels down the bed.

Where an overhead crane is employed, the dolly may be replaced by a concrete block. The templet. or some simple holding device, is secured to the block, which is then picked up by the bed, dragging the strands behind.

When the templet arrives at the opposite end of the bed, it is re-

moved from the dolly and anchored. If it is pulled to the anchorage end of the bed it is usually dropped behind anchor posts. However, if the bed is set up so that the dolly is pulled toward the jacking end, the templet is removed and locked into a jacking frame.

#### Jacking Equipment

Methods of tensioning vary considerably. Yet all systems must incorporate certain functions. Jacks should be powerful enough to handle the largest anticipated loads on the beds, yet portable enough to be shifted easily to adjacent beds. The jacking system must provide a method of transmitting the tension

load to the end abutments so that jacks can be removed and reposi-

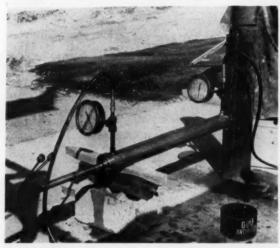
Another important function of the jacking system is detensioning. Instead of cutting the strands one by one, thereby inducing unbalanced prestressing forces, it is better to release tension with the jacks so as to prestress the members uniformly.

One final requisite of a good jacking system is close control over the huge forces which come into play. Often, the stressing force is well over 1,000,000 lb, and that kind of power must be harnessed. Safety is a top consideration.

continued on next page

#### PRESTRESSED CONCRETE . . . continued

#### Single Strand Jacking



LONG-STROKE JACK fixed to post at Formigli plant in New Jersey pulls on long steel arm shown in adjoining illustration.



HOOKED ARM connected to jack tensions one strand at a time. One gripper pulls, and the other locks the strand in place.

#### **Types of Systems**

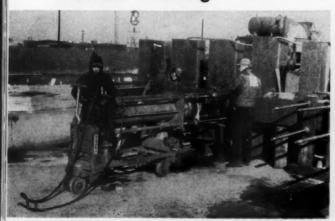
Although each bed may be a little different, there are only a few basic types of jacking devices. The simplest is the single-strand unit. Still used by some small fabricators, the single-strand jacking device was developed because a requirement in all early specifications called for initial tensioning of each strand to remove any slack. Some fabricators figured that if they had to bring in a small jack for initial tensioning, why not use it also to apply the full pull on each strand. They fixed the rear end of the jack to a post opposite the casting bed and added a pulling arm to the end of the ram. Two strand grips were employed, one for pulling and the other for locking against a templet when the proper tension had been reached.

This method had its merits where the number of strands was not large. But it raised problems of strand handling, and with large patterns, it took a long time to stress. Besides, a conventional jacking frame is still required for detensioning. And there is also a growing awareness that in many cases initial tensioning to eliminate slack is probably not worth the extra effort.

Most beds now being set up are designed for multiple-strand jacking. And there are several basic types. In all cases, the jack is set up to push in the direction away from the bed. It bucks against posts or abutments and pushes a plate or frame which is connected to the strand templet.

A system that developed in southern plants and still finds new applications consists of a single jack pushing against a head plate. Bolted to this plate, and circled around the center of gravity of the jack, are four steel rods. They reach back through or around the abutment and pull the strand tem-

### **Pull-Rod Jacking**



JACK is mounted permanently on truck at center of four pull rods, which couple to fixed pull rods in jacking abutment.



SINGLE 300-ton jack serves group of casting alleys. After tensioning, nuts are turned up, and jack is moved with hand hoist.

Page 142 — CONSTRUCTION METHODS and Equipment — February 1957

says

McDOUG Peoria, I prove a 3 way 24, involved roadway ging ditcl the 47,00 Cox analyment record most of could be But about

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D Tournapulls picked up 5-yd, pay-loads an this highway widening project. On typical 1800' cycles, round-trip time averaged 3.4 minutes. Four of these fast rubber-lired earthmovers were used on the job.

Using fingertip electric controls, 'Pull operators spread fill evenly in farmer's yard. At another farm, "D's" spread waste material to build a stockpond dam across a shallow depression in a field.



# "Only equipment we could use to get job done economically,"

## says Supt. Ralph Cox

McDOUGAL-HARTMANN CO., of Peoria, Illinois, contracted to improve a 3¾-mi. section of U.S. Highway 24, near Mt. Sterling, Ill. It involved widening each side of the madway by 1½ to 2 feet, plus digging ditches. Before work started on the 47,000-cu. yd. job, Supt. Ralph Cox analyzed the job to make equipment recommendations. He found most of the yardage to be moved could be used to build up shoulders. But about 8,000 excess yds. would have to be wasted.

Taking all factors into consideration, Supt. Cox reported: "D Tournapulls are the *only* machines that can get this job done economically." Here are his reasons why:

Crawler-scrapers couldn't be used because they would dig up farmers' driveways and fields when hauling waste fill. They could not cross the highway without special planking. And most important, their slow speeds would run up dirtmoving costs, prolong the project, cut the profit margin per pay-load.

2 Elevating graders and trucks were also considered. This method would have required a large fleet of expensive trucks, plus a number of flagmen to handle traffic on this heavily traveled highway. So the McDougal-Hartmann Company bought 2 high-speed rubbertired D Tournapulls and rented 2 more to handle the scattered ditching, shoulder-building, and wasting called for on this job.

## 5 yds. in half a minute

"D's" worked both sides of the road, alternating from side-to-side for distances of about 1000 ft. Push-loaded by a motor grader or crawler tractor, the "D's" heaped 5-yd. pay-loads of clay-loam in less than half a minute. Fast rubber-tired scrapers completed an average 1800' cycle every 3.40 minutes. This included .42 min. for loading, 1.47 min. hauling, .26 min. spreading, and 1.25 minutes return. Not only were the 29.5 mph "D's" profitable producers for McDougal-Hartmann on these short cycles, but they proved to be even more economical on the long 3000' one-way hauls that followed.

# Constructive use of excess dirt popular with farmers

Excess dirt was used to improve farm yards and fields in the area. On a typical operation, after loading from ditch cuts, "D's" crossed the highway and spread waste dirt over low spot in a farmer's yard. When that farmer's yard was finished, they switched over to build a stockpond dam across a shallow depression in



"D's" ability to travel fast over existing paved road, without damaging surface, was one of the reasons it was chosen to move earth on the U. S. Highway 24 widening project.

another farmer's field. As a result, two local land owners benefited, and the excess dirt problem was solved without bother, delay, or expense.

#### "Ideal for scattered jobs"

Supt. Cox said, "'D's' were ideal for this job where scattered cuts and fills along right-of-way were necessary."

He also liked their ability to get into farmers' fields without elaborate preparations and precautions against property damage. He added: "Crawler tractors would have dug up the fields so much that the farmers would have refused the fill material."

Improved "D", now available, has 9-yd. max. heaped capacity, 8' width, and permissable axle-load... needs no special road permit. Ask for details.



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

# clevelands dig 200 miles for water system in Gwinnett County, Ga.

Buchanan Pipe Line Company, Inc. of Birmingham, Ala. used 5 Cleveland trenchers to dig 200 miles of trench for a county-wide water system in Gwinnett County, Ga.—a multi-million dollar project requiring approximately 275 miles of pipe work. Digging 11" to 30" wide and 2½' to 4' deep in rolling terrain and in soil ranging from rock to sand clay, each of the 5 Clevelands averaged 3,000 feet of trench per day, working in wet weather.



Paul A. Buchanan, executive vice president of Buchanan Pipe Line Company, Inc., says this about Clevelands:

"We have bought 12 Clevelands since 1945, are now operating 6. Their performance has been entirely satisfactory, as evidenced by our repeat orders. In wheel-type machines we have standardized on Clevelands. We particularly like their simplicity of operation and maintenance and their good performance under adverse conditions."





THE CLEVELAND TRENCHER COMPANY

20100 ST. CLAIR AVENUE . CLEVELAND 17, OHIO

# **Center-Hole Jacking**



PAIR of center-hole jacks begin tensioning low, wide strand pattern as men reach into windows to turn up nuts on pull rods.



HIGH JACKING POSTS can handle either two or four jacks, depending on pattern. Nuts are turned in space between posts.

plet along the bed, stressing the entire pattern at the same time. Depending on the needs of the bed, the jack may vary from 50 to 300 tons capacity.

When full tension is applied, the load is transferred to the abutment. And there are several ways of doing this. Most common method is to use threaded pull rods. Men turn up nuts tight against the abutment, and the jack can be removed. At some plants, the jack is simply lifted from its cradle by an overhead hoist, and at others it is mounted permanently on a cart or roller and is wheeled by hand to the next position.

#### Disadvantages

But the industry is not unanimous in its acceptance of the pullrod system. There are problems of eccentric loading, and there also are problems of safety.

The pull-road and single-jack arrangement works well with members having simple, symmetrical strand patterns, for instance a pile with concentric strands. But often in large beams the pattern is spread-out or unsymmetrical, and then it is not simple to get the jack to act at the exact center of gravity of the pattern. Eccentricity can result, which could bend the jack, distort the frame, or induce unbalanced loads.

Safety factors are equally as important. Pull rods have been known to fail during tensioning and fly down the bed like a slingshot. And sometimes a nut will fail.

Because of the tremendous forces involved, it is not advisable to have any men near the jacks during tensioning. One firm keeps men away until tensioning is completed. Then they quickly clamp a split nut over the threaded rods, back off on the jacks, and transfer the load to the abutment. This eliminates the hazards to men during tensioning, but it doesn't provide anything for catching the load if a failure occurs during tensioning.

Probably the most foolproof pull-rod system was developed for the Lake Pontchartrain Causeway job. Because the operation was so big, jacks did not have to be removed. In fact, they were embedded right in the abutments. Each ram was threaded, so that a hydraulically operated nut could be kept turned up tight against the abutment at all times. Operations were controlled from a panel board set up at a safe distance. The arrangement was foolproof, but applicable only for that specific job. The commercial fabricator must look further to improve his pullrod system.

## Center-Hole Jack

Another basic type of tensioning system employs the center-hole jack. Either two or four jacks are used, with only one pull rod running through the center hole of each jack and bolted to the end of the ram. Double anchor posts are required to transfer the load. The jack bucks against one—and the nut on the threaded rod bucks against the other.

The system works well on a number of beds, but it has disadvantages. Need for double anchor posts is one problem, but the difficulties of moving the jack are more serious. Instead of simply lifting the jack from its cradle—as

would be done on a conventional push jack—the center-hole jack must be partially dismantled, pulled off one rod, moved to the next, and carefully threaded over another rod. It's a slow operation.

### **New System**

Latest jacking arrangements eliminate pull rod entirely. Instead, the strand templet is mounted right on the push plate, or carriage, at the head of the jacking rams.

The carriage can be pushed by either two or four jacks, depending on the strand pattern. A two-point system is desirable for a double-tee bed, and a four-point system for a universal beam bed. The latter system can handle forces up to 1,400 kips.

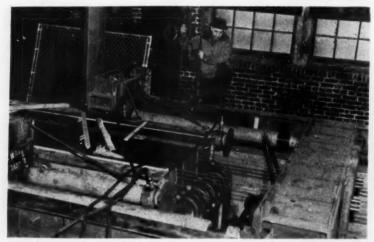
The system has several advantages. Jack positions can be adjusted easily to place them in a circle about the center of gravity of any strand pattern. With four 300-ton jacks, it can handle the huge loads demanded by modern designs.

Yet to be developed is an efficient, foolproof device for checking the load in case of failure and for transferring it to the abutment. Beds employing this arrangement now depend on large heavy-duty screw jacks to release the push jacks.

Here's how it works. When the push jacks complete tensioning, screw jacks are dropped into place between anchor posts and carriage. They are turned up tight against the carriage, and the force is transferred through the screw jacks into the posts.

This arrangement eliminates the hazards of pull-rod failure, but

# **Templet on Carriage Eliminates Pull Rods**



STRAND TEMPLET in latest jacking systems is mounted on carriage (right). Here, push jacks are retracted, and screw jacks are maintaining tension in double-tee bed.



FOUR JACKS (only two visible) push carriage which mounts strand templet. Screw jacks take over at full elongation. This four-point jacking system can handle huge forces.



PANEL BOARD operates hefty four-point system. Positions of jacks can be adjusted to handle any strend pattern. Volumetric control assures uniform elongation of jacks.

# PRESTRESSED CONCRETE.

it does not provide a device for checking the load if something fails during tensioning. The screw jacks are not inserted until most or all the jacking is completed. However, designers are now working on a modified screw jack that can be left in place permanently.

Another safety hazard that exists in all beds is the danger of a strand breaking during tensioning. But it's simple to install the proper protection. In fact, a portable section of wire fence placed across the jacking posts is very effective.

#### Jacks

Jacking equipment demands special consideration. There can be no weak links in the system. Pumps, lines, valves, and jacks should be checked often.

High-pressure jacks operating at about 6,000 psi are most effective. Models range from 50-ton to 300-ton units, but the popular sizes are 150-ton and 200-ton. They are interchangeable in many types of beds and offer the most universal applications.

Hydraulic lines are no less important. They are a point of possible failure and should incorporate a safety factor of three or four. But the safety factor is good only so long as the lines are protected in the field.

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The most accurate way to control strand tension is through elongation of the rams on the jacks. But with an unsymmetrical strand pattern, it is not always possible with conventional equipment to assure equal runout. A new system, developed by Elgood Hydraulics Co. of Brooklyn, N. Y., is specially valved with directional and volume controls for holding the load at any time during the tensioning cycle even though line pressures are unequal. Volumetric control assures uniform elongation and has the advantage of minimizing the necessity of circling the jacks about the exact center of gravity of the strand pattern. So long as elongation is uniform, a slight eccentricity will not harm the jacks or twist the jacking frame.

#### Forms

Fortunately for the new fabricator, the development of special forms for prestressed products has more than kept pace with the fast-



Sold By E. F. Craven Co., Greensboro, N. C.

# for the North Carolina State Highway & Public Works Commission

Helping to keep the roads of North Carolina in top shape is the job of a fleet of TL-12 Tracto-Loaders — 31 in all!

"We like their all-round ability," says the North Carolina State Highway Maintenance Department. The TL-12's load crushed stone, sand, gravel or topsoil as needed. Pick up and load excess material pulled from slopes and ditches. Handle general utility work — such as loading pipe and drums of oil.

You not only get your money's worth from the TL-12's ability to do many jobs well . . . you save money on every job because these 11/8-yd excavator-loaders work faster, and there's less maintenance.

Every load is a big load with the tip-back bucket and smooth, positive hydraulic torque converter drive. And

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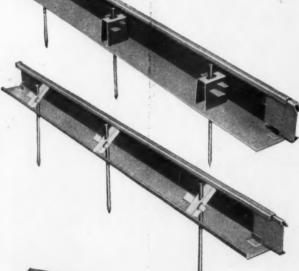
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## REX AIRPORT FORMS

The high-strength forms with the rapid setting advantages. Rugged double stake pocket construction with perfect-fit slide locks gives better alignment. 100% welded of special alloy steel for maximum strength and rigidity...lasting durability. In the sizes you need—with the speedy delivery you want. Also new Rex Two-Way Airport Forms—with the double advantages of handling two slab thicknesses with one set of forms. Check Rex First!

# **REX** is the complete Concrete Paving Line!

Cut your costs and assure best results—take advantage of the job-speeding benefits of the complete Rex Concrete Road Builders Line: Pavers...Spreaders...Finishers...Float Machines...Curing Machines (all available

with powered-frame widening and transportation rigs)...Subgrade Planers and Testers. Also Curb, Gutter and Sidewalk Forms. CHAIN Belt Company, 4664 W. Greenfield Ave., Milwaukee 1, Wisconsin.

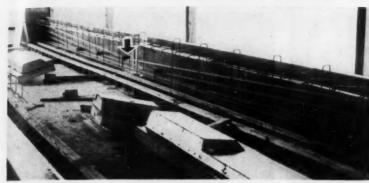


PAVERS . SPREADERS . FINISHERS . FLOATS . CURING MACHINES . FORMS

CHAIN BELT COMPANY

MOTO-MIXERS . BUILDING MIXERS . PUMPCRETE . RAILPORTER . PUMPS

# **Good Forms Boost Casting Efficiency**

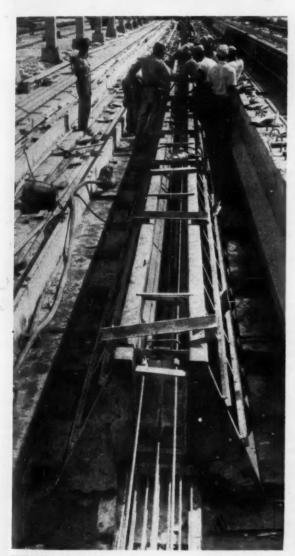


NEW TREND in pre-tensioning is to drape strands for better structural efficiency. It can be done by pulling down (above) or holding down with form bracket.

growing industry. Pioneered by the Food Machinery and Chemical Co. of Lakeland, Fla., form designs have been developed for virtually every product.

For maximum economy, all forms are made of steel plate. The key to their efficiency is interchangeability. For instance, only four sets of basic I-beam forms can produce 30 different sizes of standard beams. Interchangeable soffits and inserts permit the wide range of shapes.

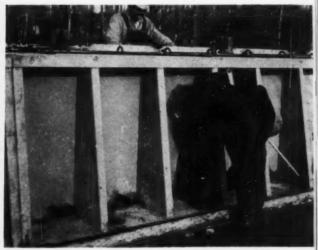
Generally, the bottoms of opposite side forms are locked in position against a soffit with tie rods and



BRIDGE-BEAM FORMS are erected on casting alley. Note how steel bulkhead is braced against cat-heads clamped to strands.



PLYWOOD BULKHEADS threaded over strends before tensioning are braced in place. They are removed when strends are cut.



SIDE FORMS made of steel plate are tightened against wood soffit with tie rods and wedges. Soffit also produces camber.

# **Bulkhead Slips Over Tensioned Strands**



DOUBLE STEEL-PLATE BULKHEAD is excellent for hollow, octagonal piles. Four plates are bolted together, fixing each strand When bolts are removed, it strips easily.



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in position. Bracket on top of fourth piece connects to side forms.

wedges; the tops are held firmly in place with adjustable spreader rods. Side forms are usually fabricated in 10-ft lengths, but can be bolted together in 20 or 30-ft lengths for more efficient handling.

If a number of uniform crosssection members are to be cast, a continuous form is preferred. Bulkheads can be placed anywhere, so that any length beam can be formed.

Good example of this type operation is Reid Contracting Co.'s bed at Paramus, N. J. Reed is casting 350 beams for 18 bridges on the northern extension of the Garden State Parkway. They require up to fifty-two %-in. strands per pattern, and beams vary from 50 to 70 ft in length.

Reid has two 440-ft casting alleys, and he completes a full-length pour on one of the two alleys each day. Steel forms handled in 30ft lengths are erected as a continuous unit.

If the beam's center section is not the same as the end sections, which is typical of Florida's standard bridge members, forms are fabricated in 10-ft standard intermediate units and 5-ft standard end units. To provide the exact beam length desired, intermediate form sections may be obtained in a number of lengths.

Special interchangeable steel forms also are made for square and octagonal piles, solid or hollow, and for pan-type bridge decks, lintels,

#### Bulkheads

One phase of the forming operation that demands a lot of contractor ingenuity is the bulkhead, the part of the form that shapes the ends of the member. It is difficult to standardize because so much depends on the shape of the piece to be cast. For instance, sometimes it is better to thread untensioned strands through a bulkhead, and at other times it is preferable to erect a bulkhead around tensioned strands.

At any rate, bulkhead design is important. It can save much time in a repetitive operation.

A lot depends, once again, on whether the form has a uniform cross section. If it does, it may be better to thread the strands through a bundle of identical onepiece bulkheads. After the strands are stretched along the bed, the bulkheads can be moved along them and left at any desired point.

Most fabricators, however, employ a segmented bulkhead which can be erected around tensioned strands at any place along the bed. Made of both steel and wood they are braced in several ways. Steel "cat-heads," which are small open steel sleeves anchored to the strands with set screws, can support a bulkhead. But many firms rely on simple wood braces.

Bulkheads can serve several purposes. On the Lake Pontchartrain Causeway decks, they acted as lifting frames.



CAT-HEAD SLEEVES anchored to strands by set-screw brace bulkheads of pile forms.

#### Concrete Placing

The ideal concrete placing method is simply to chute the mix directly from a ready-mix truck into the forms. If beds are narrow enough, and sufficient room is available between them, it is the most efficient setup. Otherwise, the crane and bucket method will suf-

Internal vibrating should be thorough. New narrow-head high frequency units are preferred.

Curing is achieved normally by steam. It's better to invest in a large boiler to assure adequate capacity at peak loads. Tarps or curing hoods are necessary to

# 2 - 1 - 3 - 1

brings 2½-yd. shovel users "JOY STICK" AIR CONTROL for easier operation new performance-profits!

# FOR INCREASED CAPACITIES

The Lorain-85A is a 21/2-yd. shovel with 41 to 48-ton capacity as a crane on a general-purpose 2-speed crawler.

- An extra-wide, extra-long crawler provides for crane capacities of 50 to 60 tons.
- New square-tubular-chord crane boom design reduces boom weight and increases lifting capacities. On large crawlers, boom length to 200 ft. long, plus 40 ft. tip extension may be used.
- New 21/2-yd., 62-in. wide Hoe bucket now available on 27 ft. boom. Other Hoe dipper sizes available beginning at 11/2-yd.
- removable rear counterweight reduces overall weight. Can be removed in a matter of

# Greater operating ease with 2-lever "Joy Stick-Air Ease" power controls. "Metered Air" feeds power to clutches at any role and to clutches at any rate and amount desired and still retains full "feel" of all operations. The newest, simplest, most responsive and most effortless development in shovel-crane power controls. Less effort, less motion, less fatigue.

• Full "Air Ease" control of all crawler operations at the operator's position for tread lock, swing-travel jaw clutches and steering.

LORAIN

• All clutches are newly designed and air operated.

# FOR LONGER LIFE LESS SERVICE COST

- New Shear Ball mounting . . . the new idea in turntable mounting design. Turntable is secured to crawler and revolves easily and freely on a huge "ball bearing." No center pin or nut-no turntable rollers—with their adjustments, maintenance and lubrication.
- Torque converter power-take-off is available for the most efficient, smoothest method of taking full advantage of the abundant power sup-plied for turntable operations. "Neversay-die" power; adjusts automatically to digging needs; no shock; no stall.
- Generous use of anti-friction bearings throughout the new Lorain-85A. Used on hoist drums, swing drums and re-tract and crowd clutch drums. Crane boom head sheaves also on anti-friction bearings.

Nothing has been spared in the new Lorain-85A to put it far ahead of the field in the 21/2-yd. shovel-crane class. Every improvement, every refinement-from the new look in the new cab to the hidden anti-friction bearings-has been incorporated to give owners the last word in performance and profits. Many design improvements that increase capacity and result in easier, smoother operation enable the "85A" to live a longer, trouble-free life.

Don't miss seeing it. Ask your Thew-Lorain Distributor for all the facts and figures. Make every comparison. Only then can you appreciate the Lorain-85A built-in values that will pay you profits for a long time to come!

# "First time I ever used Armco Piling ...but it drove fast and straight"

So said Mr. F. R. Brown, project superintendent for H. G. Smith, contractor of Fitzgerald, Georgia. He was speaking in regard to Armco Welded Steel Pipe Piles that were used in replacing three county bridges on Georgia's State Route 119.

All three bridges, totaling 1500 feet in length, utilize the same basic design —bents consisting of four Armco Pipe Piles capped by a concrete beam. The two outside piles were driven on a  $1\frac{1}{2}$  to 12 batter while the center two piles were vertical. All of the piles were driven with a drop hammer on fixed leads.

## Armco Piles Have Many Applications

Armco Pipe Piles are economical and efficient for bridges on superhighways as well as county roads. They are also widely used for foundations of buildings and other structures. You will find the

right wall thickness, diameter and length for every foundation job.

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Write us for more details on Armos Pipe Piles, and also ask us about Armoo HEL-COR® Pile Shells. Armoo Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3207 Curtis Street, Middletown, Ohio. Subsidiary of Armoo Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armoo International Corporation.

Bridge No. 1 Armco Pipe Pile bents are almost completed for this 389-foot bridge. Old bridge at right.



Bridge No. 2 Armco Pipe Piles are ready for next step in building this 683-foot-long bridge. Note old

Bridge No. 3 As with the other bridges, this 424-foot-long structure has outside piles driven on a batter

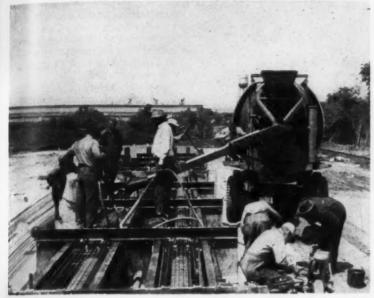


Contractor: H. G. Smith, Fitzgerald, Georgia Georgia State Highway Department: Resident Engineer, L. B. Ackerman Project Engineer, J. I. Moore





# **Direct Chuting is Best Placing Method**



PAIR OF PILE FORMS is filled with concrete from Worthington ready-mix truck. Cross members space forms, tie pair together, and also hold down Sonovoids.

maintain the proper curing temperature and to prevent excess moisture from evaporating from the concrete.

The delay between placing and applying the steam depends on the season and the temperature of the

mix. These details must be worked out for each installation. But it is important to remember that both temperature and its rate of change must be controlled carefully.

When concrete strength reaches about 4,000 psi, which is often the

next day, the bed can be detensioned. Instead of cutting the strands one by one, the jacking devices must be repositioned to release the load uniformly.

Forms are stripped easily, and the strands between each member are cut with torches, snips, or saws. How long the members remain on the bed depends on the type of unit. Normally, they can be removed in a day or two and stockpiled.

Picking up a prestressed member is not as simple as hoisting a steel beam. The member must be designed with specific pickup points, and the hooks or hairpins must be strong enough to take the load. Any old piece of reinforcing rod will not do. It must be big enough. On small members, waste strand can be used satisfactorily.

### **Handling Equipment**

A wide variety of hoisting equipment is now employed on casting beds around the country. In fact, virtually every type of crane can be found somewhere. There are crawler cranes, truck-mounted cranes, overhead, locomotive, and gantry cranes. And there are several schools of thought on which type is best. Much depends on the size and volume of the operation.

continued on next page

# Yard Cranes - Fast and Powerful

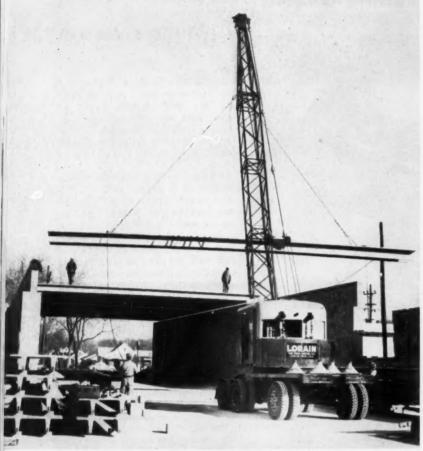


OVERHEAD 10-ton electric crane can swing form in place, pour concrete, and pull strand. Two cranes handle heavy beams.



PRESTRESSED PILE is handled by Osgood locomotive crane. These fast, powerful rigs are ideal for big casting yards.

# **Mobile Crane—Best Rig for Erecting**



SELF-PROPELLED CRANE with 50-ft boom hoists 51-ft double-tee beam. Each leg of ¾-in. cable sling has two-part spreader. Sling is adjusted to seat one end of beam first.



DECK SECTION for pier in Hoboken, N.J. is handled at casting yard by Clark-Ross fork-lift truck. Straddle trucks are popular for hauling bigger, longer members.

## PRESTRESSED CONCRETE ...

continued

Small firms prefer conventional crawler or truck cranes because of their versatility. But they travel too slowly for a large casting setup. And their cost is high because of two-man operation.

Many fabricators service their beds with electric overhead cranes. They are fast, one-man machines with high capacities. But they do present problems of getting completed material out from under the crane.

A few of the newer firms have laid out their beds straddling a railroad track which carries one or more diesel-powered locomotive cranes. These powerful machines can lift any size beam and load it directly on to a flat car for transporting to site or storage.

For secondary transporting around the yard, a fork-lift or straddle truck can be very handy. In fact, Reid Contracting Co. is hauling beams in straddle trucks over newly placed fill from yard to erection site.

#### Hauling

Transporting members to the job is handled in several ways. Flatbed trucks, railroad cars, and trailers are all suitable, depending on conditions. The important thing to remember is that the beam in transport must be supported at the same points it will be supported in the structure. Units up to 80 ft long can be transported over highways without much difficulty. Rail and water vehicles can carry bigger members—another reason for strategic locating of the casting vard.

Most versatile pieces of erecting equipment are mobile cranes. They can handle just about anything. The important factor is proper education of the operator. He must be taught to understand the type of product with which he is working, and he must realize its weaknesses. It's not like steel. You can't treat it ruggedly, or it will fail.

In short, fabricating, handling, erecting, and selling prestressed products demands a lot of knowhow. And every phase is important. For this reason, the entrepreneur will do well to know all there is to know about his product and watch its development closely. Changes occur rapidly in an infant industry.



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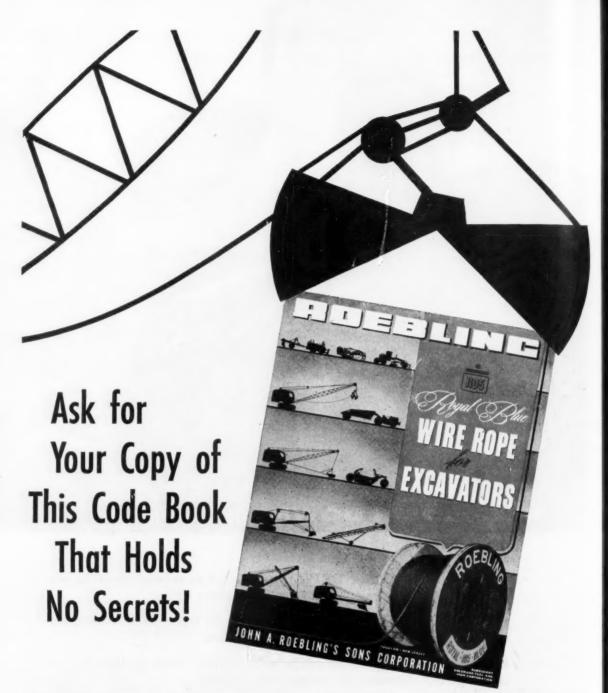
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The easy-to-follow coding system assures that you get the right rope every time. It covers hoist ropes, dragline ropes, ropes for shovels, skimmers, scraper wagons, trench hoes, clamshell cranes, slacklines, derricks, drag scrapers and bulldozers. The recommendations are for the rugged conditions you meet every day.

You'll also find supplementary data on wire rope constructions, diameters, weights and breaking strengths.

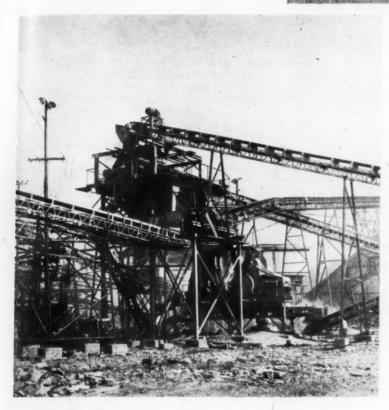
There is a copy of this 12-page booklet waiting for you. Communicate with John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Your copy will be sent promptly.

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# PRODUCING AGGREGATES



# 7. Stationary Plants

By W. A. RUNDQUIST Vice President Pioneer Engineering Works

COMMERCIAL AGGREGATES PLANTS (or stationary plants) used to be of rather simple design to meet a market for a product the specifications for which were comparatively lenient. Since War II, however, specifications for aggregates have become stricter, and new plants must be designed so the products will meet them. Older plants, a large majority of which are still in operation, have had to be modified to keep pace with the tougher specifications. This holds true for both quarry and gravel operations

Thus, it would seem appropriate to devote a chapter or two in this series to the functional design of the modern stationary aggregates plant with enough comment by way of illustration to indicate how the older plant can be modernized

through the addition of various types of units.

To the established aggregates producer, or to the individual contemplating entering the aggregates producing business, plant design should mean all phases of operation, including a full study of the economics involved. These matters were discussed briefly in the first article of this series. Now we will discuss some typical types of installations and how the units in them can be selected and operated to yield required results.

Pit materials and quarry materials are, of course, both used as construction aggregates. The methods of producing each type of aggregates are similar, but it will serve our purpose best to discuss them separately.

The simplest operation in a gravel pit is one where only a single crusher and a single-deck sizing screen are used to produce a single aggregate. See Figure 1



#### Figure 1

In this set-up, the pit material is fed onto the sizing screen which passes the material to size and sends the oversize to the crusher. From the crusher the material goes back to the screen to mix with the material from the pit. Material crushed to size is passed by the screen (along with pit material to size), and the process is continued in what we would normally call a closed circuit.

Obviously, this is not a very efficient method of producing material because the screen probably will be overloaded. Material that does not require crushing will be passed to the crusher; excess fines cannot be removed; and no adequate control over gradation of the product can be exercised.

Now let's improve on this installation by adding two more decks to the screen. See Figure 2

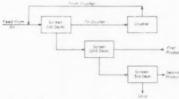


Figure 2

While this helps by giving us more sizes of products and by making possible removal of sand, it still is unsatisfactory because it will have insufficient crushing capacity for most gravel operations. The operation has become more flexible, but we still lack adequate control over these sizes and amounts.

Now if we add a second crusher and revise our screen arrangement to four decks as shown in the fol-

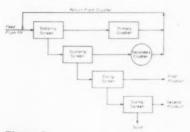


Figure 3 continued on next page

# PRODUCING AGGREGATES . . .

lowing flow diagram, we gain better control over the sizes produced and secure the necessary crusher capacity. See Figure 3 on pg. 157



Figure 4

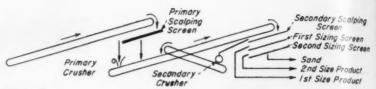


Figure 5

But this has the undesirable feature of running all the material from the primary crusher, and the secondary crusher together with pit material on to the top deck of the screen. This gives us an awkward operating cycle as we'll make some further changes to rearrange the screening system in a manner to provide more flexibility and make possible better gradation control. Instead of one four-deck screen, we'll install (1) a screen to scalp ahead of the primary crusher, (2) a screen to scalp ahead of the secondary crusher, and (3) an adequate sizing screen. See Figure 4

This arrangement offers the advantage of bypassing each crusher with material that does not require crushing. It results in greater efficiency from the crushers, reduces the power required to crush, and makes full use of the sizing screens for their intended purpose. Further, by proper selection of mesh sizes for the scalping screen and with adjustment of the crusher settings to correspond to the amount of oversize in the pit and the required percentage of fractured stone in each size of the graded product, we find ourselves in much better position to meet the specifications for finished material.

Now let's see how this flow diagram can be shown in elevation to give a better perspective of actual operation. See Figure 5

#### **Production Calculations**

Assuming that the gravel pit shows an analysis as follows, with the market as indicated, how close will we come to meeting the requirements for that market?

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Raw Material Size	Pit Analysis	Market Requirements
6 in. to 3 in.	25%	
3 in. to 11/2 in.	20%	
11/2 in. to 3/4 in.	15%	40
3/4 in. to 1/4 in.	15%	30
1/4 in. minus (sand)	25%	30
	100%	100%

Referring to Figure 5, we will begin by using the following crusher settings:

Primary crusher - 3 in. Secondary crusher - 11/2 in.

With this setting of the primary crusher, and by-passing the stone under 3 in., we note that 25% of the pit material will have to pass through the primary crusher. Of this our crusher chart tells us:

continued on page 161

# **BHEW**

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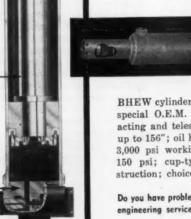
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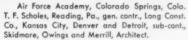
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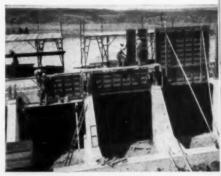
On the new Air Force Academy, for example, Long Construction Company, concrete contractor, is using 37,000 sq ft. of Symons Steel-Ply Forms. Long's low bid was based on rapid reuse of Symons Forms. The walls are battered and have counterforts on 14' centers. They vary in height up to a maximum of 32' and in widths from 12 inches at the top to 18 inches at

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Symons Steel-Ply Forms being erected for the second lift. Note "work wagons" in the background.



Pouring first lift in Symons Steel-Ply Forms. An American Economobile is being used to pour the concrete.

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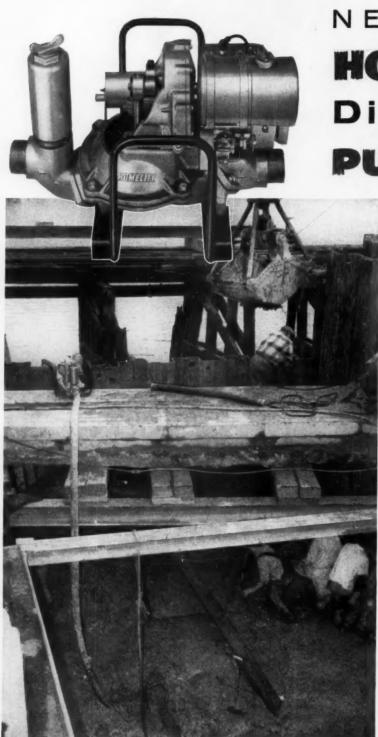
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# PRODUCING AGGREGATES . . . continued

85% of the material from the primary crusher will pass a 3 in. square opening

46% will pass a 1½ in. square opening

26% will pass a ¾ in. square opening

12% will pass a ¼ in. square opening

Since 25% of the total material was put through the primary crusher, we come up with the following percentages of the total production processed by the primary:

Product Size	Percentages of Total Product	
Plus 11/2 in.	54% x 25% = 13.5°	1/0
11/2 in. to 3/4 in.	$20\% \times 25\% = 5.0\%$	1/0
3/4 in. to 1/4 in.	14% x 25% = 3.59	1/0
1/4 in. minus	$12\% \times 25\% = 3.0\%$	1/0
	25.0°	16

Reviewing our pit analysis, we note that 20% of the material was sized 3 in. to  $1\frac{1}{2}$  in. Adding the 13.5% oversize from the primary to this, we find that the secondary crusher must handle 20% + 13.5%, or 33.5% of the total production when set at  $1\frac{1}{2}$  in. and when the scalping screen is equipped to bypass the minus  $1\frac{1}{2}$  in. crushed material from the primary crusher.

From our crusher charts, we can now ascertain that the secondary crusher will produce these proportions of material:

Product Size	Proportion Produced b Secondary Crusher	
11/2 in. to 3/4 in.	46%	
3/4 in. to 1/4 in.	32%	
1/4 in. minus	22%	
	100%	

Since the secondary crusher handles 33.5% of the total product, we can readily determine the relative proportions of the desired market output from this crusher:

# Percentage of Total Product 33.5% of 46% — 15.41% size 11/2

33.5% of 46% = 15.41%, size  $1\frac{1}{2}$  in. to  $\frac{3}{4}$  in. 33.5% of 32% = 10.72%, size  $\frac{3}{4}$  in. to  $\frac{1}{4}$  in. 33.5% of 22% =  $\frac{7.37\%}{33.50\%}$ , size  $\frac{1}{4}$  in. minus

Now we can add the crushed material to the pit material and determine how well we meet our market demands for sizes of materials:

continued on next page



# 99 ft. Continuous Pour Using Richmond Tyscrus Believed Record

M-C&S designs forms for pour without interruption

What is thought to be the highest continuous pour in the area was made by Merritt-Chapman & Scott on its pier construction for the Newark Bay Bridge. For each of the 57 piers, forms were designed for a 10' liquid head and were set to the full height of the pour. Richmond Tyscrus were used throughout; 123 1" 4-strut Richmond Tyscrus holding the highest placement – 99' 9%". Concrete was poured to the maximum design strength of tie rods and forms, and every column went up without incident.



For speeding all types of concrete form work, the extra safety margin of Richmond Tyscrus counts heavily. Strength of Richmond Tys far exceeds their published load. For instance, rigid performance tests show that 1" 4-strut Richmond Tyscrus (published safe load strength 24,000 lbs.)—identical with those used on the Newark Bay Bridge—actually test out at 38,000 lbs.

Hangers, Screed Chairs, Lagstuds and all Richmond equipment are made with the same professional attention to the contractor's



needs as are Richmond Tyscrus. Write for the 1956 Richmond Catalogue which details Richmond products and their many uses. It can save you time and money on your next job. Address:—RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y., or 315 South 4th Street, St. Joseph, Money Richmond R

### PRODUCING AGGREGATES . . . continued

Size of Product	Pit + Analysis	Primary Crushing	+	Secondary Crushing	=	Overall Production	Market Requirements
11/2 in. to 3/4 in.	15%	5%		15.41%		35.41%	40.0
3/4 in. to 1/4 in.	15%	3.5%		10.72%		29.22%	30.0
1/4 in. minus	25%	3.0%		7.37%		35.37 %	30.0
TOTALS	55%	11.5%		33.50%		100.00%	100.0

It will be noted that all the way through this problem, we have dealt only with percentages. Several observations are possible from this type of analysis. 55% of the material requires no crushing.

45% must be crushed. This indicates a coarse pit even though top size is only 6 in.

From the standpoint of feasibility of operations, we come close enough to meeting the demands of the market. We might come closer were we to open the setting of the secondary crusher slightly to cut down on the amount of sand and increase the amount of material in the 1½ in. to ¾ in. size. This might require a larger screening area at the No. 2 screening station because there would be an increase in the amount of recirculation from the secondary crusher.

We note the relative capacities required in the two crushers based on the total production of mate-

The primary must handle 25% of the input.

The secondary must handle 33.5% of the input—20% from the pit and 13.5% oversize from the primary.

The actual size of units can be selected on the basis of total tonnage or yardage desired or considered to be economically practicable. For example, if 100 tons per hr total production is required. the primary crusher must be capable of handling 25 tons per hr at a 3 in. setting; the secondary crusher must be able to handle 33.5 tons per hr at a 11/2 in. setting from a 3 in. feed; and screens must be selected to correspond. Any multiple of this tonnage output would require a like multiple of the capacities of the crushers and screens.

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In this particular instance it would be quite feasible, for 100 tons per hr production, to use a 1016 jaw crusher as the primary and either a 30x18-in. roll crusher or a 2-ft standard-head cone crusher as the secondary. If, however, 200 tons per hr an hour were anticipated, it would be sound judgment to select a 1036 jaw crusher and either a 30x18-in, roll crusher or a 3-ft cone crusher as the secondary. These capacities will allow the flexibility needed to meet probable variations in pit conditions. (For crusher selections refer to "Crushers-Part Two," CM&E Nov. 1956, p. 145.)

#### Screening

Next, our attention should be directed to the screening area required.

For the primary scalping screen we can select one with a 3 in. square opening on the top deck. A two-deck screen, with the cloth left off the bottom deck, is recommended because at some time it



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# Complete 17-mile highway in 120 working days

bate Highway 4, between Fairfax and Sleepy Eye, Minnesota, needed building to make it safe for interest traffic. On this 17-mile protest, the Minnesota Highway Dearment awarded a contract to lerghuis Construction Company, minsburg, to raise the road-grade, iden shoulders, and dig drainage itches on each side of the road.

ontract called for moving 465,000 u yds, of sandy clay in 120 work ys, so Berghuis leaned heavily pon his fast-moving, rubber-tired achines to speed production. The et he used for this project included <sup>70</sup> BIG, 293 hp B Tournapulls, ree 208 hp C Tournapulls, one 08 hp Tournatractor, three 19-yard T scrapers, four sheepsfoot rollers, o graders (one Adams 550) and ur crawler-tractors. The 10 rubberred LeTourneau-Westinghouse arthmoving units handled 100% of production dirt . . . kept the job ling on schedule.

he three nineteen-yard BT scrapers, whiled by crawler-tractors, worked head cleaning drainage ditches and uting down shoulders. Following hese crawler-scraper teams, the two mph "B's" and the three 30 mph C's", push-loaded by 190 hp crawl-

er-tractors, hauled fill from each side of the highway to raise the roadbed and widen shoulders.

## "B's" average 18 to 20 yards per load

Since the B Tournapull is a comparatively new machine, you will be interested to know about its performance on this job. Push-loaded by a 190 hp crawler-tractor, each "B" loaded 18 to 20 yards in about a 75′ load distance in 35 seconds, averaged 17 loads per 55-minute hour. Coming out of the loading area, machines traveled in 3rd or 4th gear up a 5% grade for 30′ of the average 600′ haul. Rigs made 50′ spread in a little over 18 seconds. Complete 1325′ cycle averaged 3 minutes.

#### Likes Tournatractor, too!

Contractor Delwin J. Berghuis, pleased with his Tournapulls, had this to say about his 208 hp C Tournatractor which he used for push-loading, dozing and clean-up assignments: "I am very pleased with the C Tournatractor, and wouldn't be without it, When Tournatractor is used as a pusher for C Tournapulls, it loads the 'C's' faster than the 190 hp crawler-tractors, and has more maneuverability." Operator Edward Dykstra added, "I like its

Big "B", push-loaded by 190 hp crawlertractor, gets heaped (18 to 20-yard) loads of sandy clay in 35 seconds. Rig made 1325' round trip in about 3 minutes. On one portion of the contract involving 30,000 yards, haul and return distance averaged 5,000' one way.

Fast, 17 mph Tournatractor handled scattered dozing assignments in addition to push-loading.



quick, easy-shift transmission. It is fast and very maneuverable in tight quarters. Tournatractor is much quieter to operate than a crawler."

#### Cut service time

You'll also find that, compared to a crawler-scraper combination, the rubber-tired Tournapulls and Tournatractors take about half the service time to maintain and lubricate.

#### Look into rubber-tired power

For good production at lowest-net-cost-per-yard on your dirtmoving jobs, investigate these modern, electric-control, rubber-tired machines. Whatever your job, big or small, there's a LeTourneau-Westinghouse unit available to give you more work for your earthmoving dollar. Call or write for facts and figures applicable to your particular work.

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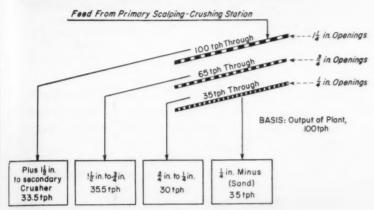


Figure 6

may be desirable or necessary to install a cloth on this deck to remove dirt or excess fines, or to take off a size of product at this point.

If we are considering 100 tons per hr production, this scalping screen must be capable of passing 75% of the input, or 75 tons per hr of minus 3 in. material. (For screen selections refer to CM&E Dec., 1956, p. 97.)

Calculations for Size of Primary Scalping

Scr	een		
Basic capacity	=	4.4 tph	
Factor A	=	1.0	
Factor B	,=	1.3	
Factor D	=	1.0	
Correction Factor	=	AxBx	D
	=	1.0 x 1.3	x 1.0 =
		1.3	

Therefore, capacity per sq ft of screening area =  $4.4 \times 1.3$ , or 5.72 tons/sq ft75 tph  $\div$  5.72 tph/sq. ft. = 13 + sq ft Theoretically, this would call for a screen approximately 3x4 ft, but this is less than a bare minimum and we should provide flexibility to meet varying pit conditions. So we would be well advised to call for a 3x8-ft scalping screen.

Next, we should consider the secondary scalping and sizing screen. See Figure 6.

## Calculations for size

Top deck, with 11/2 in. openings.

Basic capacity (mixed crusher run and pit gravel), use factor of 3.0 tph/sq ft

Factor A = 1.0 Factor B = 1.4

Factor B = 1.4

Factor D = 1.0

(Factor D is based on percent oversize fed to screen and is derived as follows: 33.5 ÷ (33.5 + 35 + 30 + 35), or

33.5 ÷ 133.5 = 25%)

Correction Factor =  $A \times B \times D = 1.0 \times 1.4 \times 1.0 = 1.4$ 

Capacity per sq ft of screening area is therefore, 3.0 x 1.4, or 4.2 tph.

100 tph ÷ 4.2 tph/sq ft = 23.8, or 24 sq ft

Middle deck, with \( \frac{4}{4}\)-in. openings

Basic capacity = 2.0 tph/sq ft

continued on next page



# **HEY! YOUR SLIP IS SHOWING!**

And your slip is showing, too, when your crawler tracks start spinning.

But you can restore full pulling power to your worn grousers in less than 30 minutes in the field with Marquette's Tractor Strip "retread."

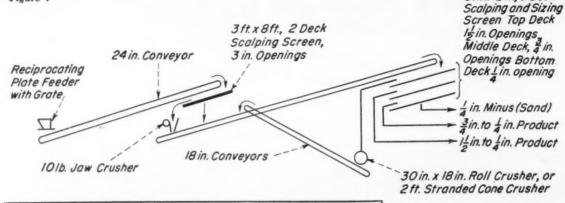
And you can save 30% or more — up to \$400 — of the cost of a new set of grousers by using easy-to-weld Tractor Strip. Often, it lasts longer than original grouser bars! Sizes available to fit all tracks.

Write MARQUETTE today for the name of your nearest dealer who handles Tractor Strip and the full line of MARQUETTE welders, welding accessories and battery charger-tester equipment.

# MARQUETTE

it lasts longer than original grouser bars! MARQUETTE MANUFACTURING COMPANY, INC. Sizes available to fit all tracks.

MARQUETTE MANUFACTURING COMPANY, INC. 307 Hennepin Avenue • Dept. 7-210 • Minneapolis 14, Minn.





# ALL-NEW MASTER TURN-A-TROWEL HAS POWER BLADE ADJUSTMENT

"This sure beats workin'", said one operator after he'd tried the all-new Master "Powermatic" 34" trowel. "I've never had it so easy in my life... or done a better job."

No wonder he likes it. He pushes or pulls a knob and engine power tilts the combination blades to float or finish.

Know what that means? He gets exactly the job he wants, faster and easier.

He doesn't have to "fight" this trowel, either. The Master's only 14" from the slab to the *top* of the engine... has the *lowest center* of gravity of any power trowel. Wobble's a thing of the past. And the direct drive puts all the engine's power to work.

You'll like the all-new Master, too. The automatic clutch that let's the Briggs & Stratton engine get to operating speed before engaging the blades. The "dead man" control that idles the engine when you let go the handle. The stationary guard ring. They all make troweling easier and better.

The all-new Master in 34" gasoline-drive is now ready. Three or four blades, whichever you prefer. Power blade-adjustment, direct drive, lowest center of gravity and other new features make it your best buy. You'll like it. See it at your distributors or write us for full details.

MASTER

MASTER VIBRATOR COMPANY 608 Stanley Avenue, Dayton 1, Ohio PRODUCING AGGREGATES . . .

Factor A = 0.9 (second deck)

Factor B = 1.4 (based on estimate of 60%)

5ft. x 12ft., 3 Deck

Factor D = 1.0 (based on 35%) Correction Factor =  $0.9 \times 1.4 \times 1.0 =$ 

1.26 Capacity per sq ft of screening area is

therefore 2.0 x 1.26, or 2.52 tph. 65 tph  $\div$  2.52 tph/sq ft = 25.8 sq ft

Bottom deck, with 1/4-in. openings

Basic capacity = 1.0 tph/sq ft Factor A = 0.8 (third deck)

Factor B = 1.0 (based on estimate of 40%)

Factor D = 0.9 (based on 46%)

Correction Factor = 0.8 x 1.0 x 0.9 = .72

Capacity per sq ft of screening area is

therefore 1.0 x 0.72, or 0.72 tph 35 tph  $\div$  0.72 tph/sq ft = 48.6 sq ft

Summarizing, we find that the areas required by decks are:

Top deck - 24 sq ft Middle deck - 26 sq ft Bottom deck - 49 sq ft

Thus, we see that the required area on the bottom deck will govern our selection. Perhaps, a 4x12-ft screen will suffice if we consider all our calculations to be close. However, we cannot account for all unknowns, and we want to be sure to take care of fluctuating situations, so we play it smart and specify a 5x12-ft secondary scalping and sizing screen.

So for a 100 ton per hr plant to produce the material specified with pit conditions as above, we come up with this plant. See Figure 7.

Up to this point we have made no mention of the probable gradation of the material in the size ranges produced. In the size range ¾ in. to ¼ in., it is possible that we could meet the designated specification No .4 to ½ in. aggregate for

continued on page 170



# Four more improvements in the Barber-Greene Finisher

Four new improvements give the Barber-Greene Finisher faster speed, faster travel, lower maintenance cost and increased power.

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Improving the Barber-Greene Finisher is not something new. Scores of major improvements have been embodied in its design since it was first released to the field 20 years ago.

These improvements have been incorporated without spectacular announcements or fanfare. They have all been based on vast experience. In fact, the Barber-Greene Finisher is now paving its second million miles, which is many times the mileage and tonnage records of all other asphalt paving machines in the world combined.

These are all proven, sound improvements developed from experiences in laying every type of mix, in virtually all conditions. Machines embodying this group of design changes are now in production and are designated as the Model 879-B.

#### Latest improvements include:

NEW TRANSMISSION-Provides both higher operating and travel speeds. The new transmission still provides 12 forward speeds giving a wider range of operation.

HIGHER SPEED TAMPER—This new design permits faster laying speeds and reduces maintenance costs.

NEW CRAWLERS-Precision-drilled pads and larger pins will further decrease maintenance costs.

NEW POWER UNIT-20 % more power. This means pushing even bigger trucks, handling even steeper grades, greater reserve for high altitude, and higher speeds of operation.

## Note To Barber-Greene Finisher Owners

These latest improvements, as well as many previous improvements, can be incorporated in your old machine. Necessary parts are now made up in kit form for each modification separately. A folder describing the various kits is available.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

(Advertisement

# SOME UNUSUAL WAYS

Michigan Tractor Shovels are saving time and money for paving contractors around the country



Feeds portable crusher—Making good use of its high lift, Michigan Model 125A digs and dumps raw bank gravel into hopper of 100-ton-per-hour base material plant. Photo comes from Southern Hills Inc. pit near Dayton, Ohio, where the 2 yd Michigan did the work of a more expensive, less versatile, far less mobile excavator-crane.

**Grades shoulders**—Special side bucket attached to Michigan 175A grades 3 ft shoulder next to newly-poured slab. Unique rig does jobs not possible with grader drop-blade . . . including filling holes, distributing gravel, removing spoil. Attachment, designed by Villa Contracting Co, is helping widen 27 mi of N.J. Garden State Parkway.

Pours concrete—Hauling concrete in Michigan Tractor Shovel bucket, Slattery Rock Corp. solves problem of laying 6 lanes of New York's Deegan Expressway under low viaduct. Two of these maneuverable "buggies" needed only 4 hours, 200 to 250 trips to pour 800 ft of each 12 ft lane.







Carries pipe—One of Peter Kiewit's Michigans serves as allaround handyman on company's Indiana Turnpike contract. This 95 hp model lifts up to 11,000 lbs, carries 5,500 lbs at 4 mph. Note excellent all-around visibility given operator.



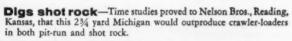
Breaks, loads asphalt—Before resurfacing street in Worcester, Mass., Contractor Charles. Chaffee uses 1½ yd Michigan to strip old asphalt. No "ramming" is required—powerful breakout quickly shatters paving.



Cleans pavement—Highway must stay open said Nashville officials, so Wright & Lopez do cleanup with small, agile 16 cu ft Michigan. Only 4'2" wide, 10'8" long, unit works rapidly, doesn't block traffic, doesn't damage newly-set pavement.



Removes sewer cover — When other big loaders failed, Kirby-Erwood's 133 hp Michigan succeeded in prying off this 2-ton concrete cover. Assignment was part of cleanup before widening Los Angeles freeway.



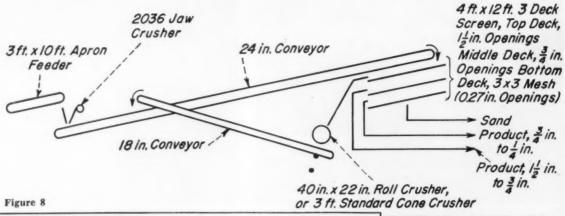
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## the shortest time between jobs — a MILLER Tilt-Top!

Model tandem \$2,295.00\*

It takes just ONE man to load this big Barber-Greene paver on the Miller OT-13 ton Tilt-Top . . . the shortest time between jobs for whatever equipment you haul. Faster loading, precise easy backing, on-a-dime maneuverability, cuts time between jobs . . . ups your profit—production time for men and equipment every day! Till-tops from 3 to 15 tons capacity—equipped with single or tandem axles...over-the-wheels or between-the-wheels platforms . . . put mobility under dozers, pavers, rollers, and trenchers of almost any size and shape.

Built for the "long haul", all Tilt-Top models have MILLER'S massive "EDG-SUPPORT" frames, Timken roller axle bearings and 2" oak deck platforms. Tandem models are equipped with a heavy box section walking beam that provides independent wheel action on each side for a more level ride and less jarring over rough terrain. It is one of the few trailer walking beams mounted on trouble-free Timken bearings.

Best of all . . . you pay no premium for quality—no comparable trailer undersells a MILLER! See these production boosters at your MILLER distributor today—and compare!



Model "BT"-10 tandem \$1,630,00\*

\*F.O.B. Milwaukee Complete with platform and tires. Any optional uipment extra.
\*Plus 10% Federal Tax

V built best V priced best

See your MILLER distributor or write for FREE literature to:

# PRODUCING AGGREGATES ...

a portland cement concrete, which

Sieve Size	Percentage	
Square Openings	By Weight	
-	Passing	
3/4 in.	100	
1/2 in.	90-100	
3/8 in.	40-70	
No. 4	0-15*	

\* Not more than 5% shall pass a No. 8

If our material failed to meet this specification, it possibly could be made to meet it by one or a combination of adjustments in our set-up. We could determine conformance, of course, only by a sieve analysis of our product. Such analysis would give us a curve which, when superimposed on the graphic representation of the specification, would indicate the steps to be taken.

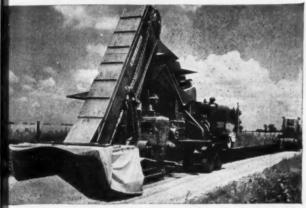
There is a certain amount of adjustment possible in the two crushers. If this failed to produce the desired results, we could turn to modification of the screen openings on our various sizing decks. Should this fail, we would have to resort to rescreening, or to blending of extra material, or both. These are all matters of judgment and experience and are only possible of achievement during actual operation of the plant.

#### Quarries

When a crushing and screening plant is to be worked in a quarry, we must remember that the amount of crushing to be done will be greater than in the average gravel pit. Consequently, for the same total output, we shall have to use larger size crushing units. Up until recent years, it was generally understood that a quarry

continued on page 177

An International UD-18A powers the cyclone dust collector and a UD-1091 operates the dryer in this Barber-Greene Model 848 bituminous plant owned by Hallet Construction Company, Ames, Iowa.



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Rock County, Wisconsin, is now in the paving business with this Barber-Greene Model 848 Travel plant. Towing loader uses an International UD-350 and the mixer uses a UD-18A.



100% International power units and trucks is the rule for Hazelmore Bituminous Co., Fairmont, Minn. Their Barber-Greene Model 848 continuous-mix plant is powered by a UD-18A and a UD-24.



# ... WHY specify

# International Power Units

# for bituminous plants?

These owners of Barber-Greene bituminous plants and pavers would give you these hard dollar reasons: Internationals have more features that pay off in lower production costs—and unsurpassed parts and service support for your convenience.

**Economical?** You bet, with a clean-burning exclusive injection and combustion system...a 45° angle of injection...new open-face single-orifice nozzles that give thousands of hours of coke-free operation.

**Weather-proof?** Definitely, with seconds-fast all-weather gasoline-conversion starting...full-flow filtering of all fuel, lube oil and air.

**Dependable?** Sure thing, with such features as tocco hardened crankshaft journals, precision insert bearings and replaceable hardened sleeves.

**Heavy-duty?** That's the only type of engine International has built in 55 years. And the positive-type valve rotators that make valve grinding such an infrequent need is just one of the famous IH long life features that have helped sell more than 400,000 diesels.

For more information, just see your easy-to-locate International Power Unit Distributor or Dealer. He'll provide proof you can specify and get an adaptable International power unit that's exactly right for your new or used machine. So be sure of profitable power for a long time to come by specifying Internationals for all of your driven machines.

Even in Djakarta, Indonesia, the preference is for International power units. Here a UD-6 powers the government-owned Barber-Greene Model 879-A Finisher.



# INTERNATIONAL° CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Side-Boom Tractors...
Self-Propelled Scrapers and Bottom-Dumps...Crawler and Rubber-Tired Loaders...
Off-Highway Trucks...Diesel and Carbureted Engines...Motor Trucks.



# NEW International

with fast-loading, dirt-heaping, clean-

Now...all the advantages of famous International scraper design are available in two new towed scrapers—to turn big International crawler power and traction into big-bonus yardage. The new 20 cu yd heaped 4S-85 is matched in weight and capacity with the giant TD-24 to pile up profits on the fill. The 14-yard heaped 4S-55 is a cycle-speeder behind TD-18 heavy-duty pull!

Turn on International crawler power with one of these new scrapers—and watch the dirt boil in freely compact itself into corners—build up an extra-yardage heap. These new scrapers have flush-smooth bowl interiors for flow-easy dirt action. You've never seen such fast, easy, big scraper loading! And outsidemounted apron arms insure super-speedy, load-trapping apron action!

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Ground-hugging profile and low draft arm connections give these new International scrapers an amazing new load-heaping line of draft—plus greatly increased *all-speed* stability for rough-terrain hauling! Roll-out ejection assures fast dumping, and positive discharge of wet, sticky material!

Study the extra yard-getting features of these new big-capacity scrapers from the new balanced, easy-hitch tongue to the big-target push-block. Ask your International Construction Equipment Distributor for a demonstration.



# INTERNATIONAL Construction Equipment

International Maryester Company, 180 N. Michigan Avenue, Chicago T. S.

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Side Boom Tractors . . . Self-Propelled Scrapers and Bottom



# SCIAPEIS Jumping design!

## IEF SPECIFICATIONS:

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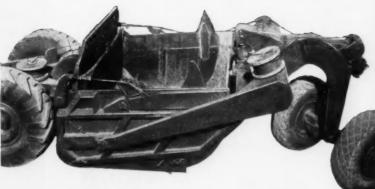
Of

Recommended Capacity (with Sideboards) Weight
let Tractor Size Struck Heaped Struck Heaped (Approx.)

85 TD-24 16 20 19 22 37,200

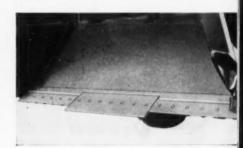
55 TD-18 10 14 12 15 26,360

introlled, even spreading is accomplished positive, power-saving roll-out ejection. High-tapron, opened by ejector, eliminates excessive eve travel and complicated reeving. All four es of these new scrapers are individually receble, to minimize downtime, reduce repair exast! Below, the model "55" and TD-18 on the fill.



New fast-loading bowl design is obtained with a low rear apron contour that gives positive, built-in dirt-boiling action under all loading conditions. Even the wearbars protecting tilting floor hinge are blended into cutting edge bed—to insure smooth dirt flow!

New cutting edge, where boiling action begins, consists of three equal-length, completely interchangeable and reversible sections. This design simplifies your parts inventory! And the cutting edge depth can be quickly changed to three different positions to match soil conditions and increase loading efficiency!

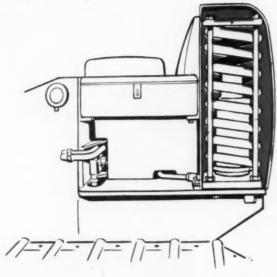


Exclusive power-saving double ball bearing sheaves maintain correct sheave alignment—provide increased cable and sheave life in these new scrapers. Below, it's the new 20-yard model "85" International scraper being self-loaded by a TD-24 crawler.





Exclusive Hydro-Spring reduces the effects of shock forces by an actual 67%, or more. Quly International Drott gives you Hydro-Spring advantages.



# How patented Hydro-Spring increases equipment life and capacity

Exclusive International Drott Hydro-Spring is a hydraulic cylinder enclosed in a heavy-duty locomotive-type coil spring. Shock force displaces oil from main lift cylinders into the Hydro-Spring cylinder—extending it and compressing the big spring to absorb and cushion impact loads.

Owners declare that Hydro-Spring adds a whopping 25% to loader and tractor life—besides reducing downtime and boosting production!

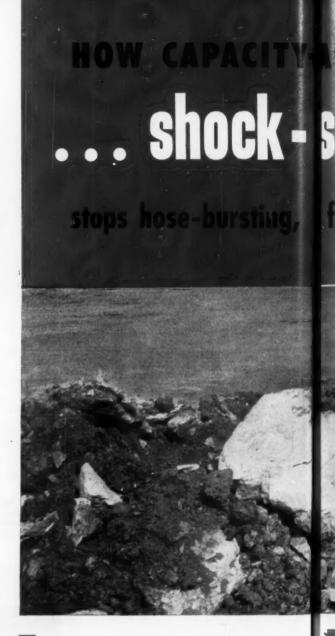
Try Hydro-Spring, turned on and off, to prove a vital money-making difference between International Drott and unprotected front-end loaders! Measure the job-getting, yard-adding advantages of exclusive triple-power, pry-action break-out and other International Drott exclusives. And see how you can beat a fleet of limited-duty rigs with an exclusive Four-In-One. See your International Drott Construction Equipment Distributor for a demonstration.

International Harvester Company, Chicago 1, Illinois Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL.

DROTT



When you're semi-skidding heavy bucket-loads of material over rough terrain, and the skid-shoes contact a high spot abruptly, linkage isn't pounded—and your spine isn't mauled! Shock-swallowing Hydro-Spring takes over. No pain—no strain!



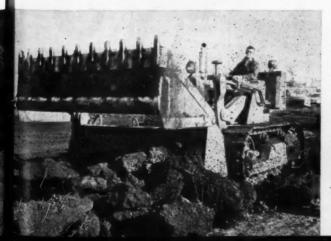
- swallowing Hydro-Spring

frame-mavling, spine-smacking impact!

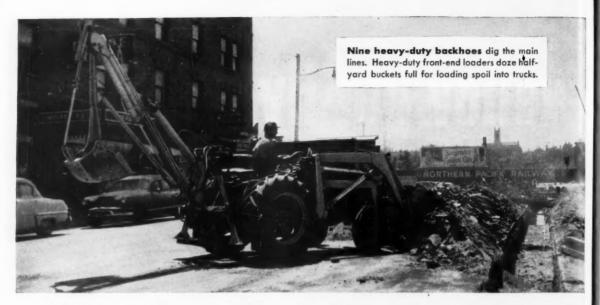


When you're using the Four-In-One in dozer position and plow into tough material like this hard-frozen soil, you don't overload hose connections with a tooth-jarring crash. Shock-swallowing Hydro-Spring "gentles" trouble-causing forces by two-thirds, or more.

When you dump a bucketful of rock in one sudden clatter, don't brace for a bump, or expect something to break loose. Shock-swallowing Hydro-Spring cushions impact, thus cuts time loss, and practically eliminates hydraulic hose failures.







# 700 miles of gas line trenching ...dug with 14 International Utility tractors



Four rear-mounted trenchers dig the lateral lines. There's a crawl speed to match any digging job...variable from 0 to 600 feet per hour at the touch of a lever.

There are 5,000 IH dealers for prompt sales-service wherever your job is located! Your IH dealer will demonstrate. Look in the classified . . . call today!

See your

# INTERNATIONAL HARVESTER DEALER

International Harvester products pay for themselves in use—McCormick Farm Equipment, Farmall and International Tractors . . . Motor Trucks . . , Construction Equipment—General Office, Chicago 1, Illinois.

Natural gas for the Pacific Northwest! Over 700 miles of main and lateral gas lines will soon give city-wide distribution for Spokane, Washington. All trenching is being done with rugged, work-eating International 300 Utility tractors... chosen for exclusive use on this job by Hall-Mac Construction Co., Houston, Texas.

Up to 1,000 pounds greater built-in weight in this rugged utility tractor gives greater backhoe pressure for faster digging... traction for bigger loader bites.

Work-speeding options also cut costs. Integral power steering saves time and effort in turning and loading. Timesaving Torque Amplifier boosts push or pull power up to 45 per cent... on the go, gives 2 speeds in each gear.



# ...the new, still more powerful INTERNATIONAL 350 UTILITY

Response like you've never known! Feel the smooth, new power of the engine. See the new, even more rugged, extraheavy-duty front axle. Add these to many other time-tested features . . . the new International 350 Utility gives greater cost-cutting capacity than ever. Choose gasoline, LP Gas, or diesel engine.

CRUSHER SETTING OF 4 IN.

Top Size	Percent Passing	Product Size	Product Percent
(Processed by jaw)	100%		************
11/2 in.	35%	Over 11/2 in	, -
¾ in		11/2 in to 3/4 in	
		¾ in.to ¼ in.	8%
/4 in	12%	Minus 1/4 in	12%
		Total	100%

1½ in. products. At this setting, roll crusher will produce 143 tons per hour.

From tables check stage of reduction for roll crusher. With two fine corrugated shells, stage of reduction is 2½ in. (See tables CM&E Nov., 1956 p. 145). 2½ in. + 1½ = 4 in., therefore, setting of jaw crusher should not exceed 4 in.

4. At 4-in. setting, jaw crusher will have a nominal capacity

operation involved 100% crushing; that is, all the rock to be processed was put through the primary crusher. Within recent years, the trend has been toward some scalping ahead of the primary crusher, by-passing it with the stone of a size corresponding to the crusher setting.

In Figure 8, we outline the flow of material through a rather simple quarry plant, but as we do not know the amount of material that would by-pass the primary crusher, we shall consider maximum feed to the plant to be that which the primary crusher can handle.

Here we have an installation made up on the following basic units:

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3x10 ft	apron feeder
2036	jaw crusher
40x22 in.	Roll crusher, or
3 ft	Standard cone crusher
4x12 ft	Vibrating screen
	Conveyors, bins, hoppers, etc.

With these units arranged as shown, what can we reasonably expect in production tonnages of the following sizes of product?

1 1/2 in. to 3/4 in. 3/4 in. x 1/4 in. 1/4 in. minus (sand)

Following is our solution to this problem, using the roll crusher tables and data as a guide. There would be some slight variation in the figures if cone crusher data were used; however, the over-all results would be equivalent.

 Select screen cloth to correspond with sizes to be produced:

Top deck  $-1\frac{1}{2}$  in. square openings Middle deck— $\frac{3}{4}$  in. square openings Bottom deck—3x3 mesh (.27 in. opening)

2. Set roll crusher to produce





# Sherman Power Digger Digs Six to Eight 60 Foot Trenches, 7 Feet Deep, in a Single Day!

Five Sherman Power Diggers, averaging 40 hours of work each, every week, are doing more than their share to maintain the position of Bell Plumbing and Heating Co., Denver, as one of the nation's major contractors.

As Mr. William Stecher, plumbing superintendent for Bell, puts it, "We have found that this equipment can dig six to eight sixty-foot ditches a day. All of them are seven feet deep. I would guess that each machine does the work of six men at about one half the price."

In addition to digging trenches forwater and sewer

lines, the Shermans are used for a variety of other digging and trenching jobs about the building sites.

With their Shermans on the job, Bell Plumbing and Heating no longer has to sub-contract normal digging jobs. Before purchasing the units, schedules often had to be adjusted for the sub-contractor and delays of several days were not uncommon. Now, work is completed on schedule.

Sherman Power Diggers can cut costs and speed production for your company, too. See your local Ford Tractor dealer TODAY for a demonstration or write for free Bulletin No.

See the Sherman
Power Digger soon
at your local
FORD TRACTOR DEALER



\*Designed, Engineered and Manufactured jointly by Sherman Products, Inc., Royal Oak, Michigan. Wain-Roy Corporation, Hubbardston, Mass.

## DO YOU KNOW?

THE EUCLID ST SCRAPER...



easiest loading
small scraper!

Self-loads in good scraper materials!



143 horsepower, 7-yd. struck capacity, 9 yds. heaped at 1:1, 18.00 x 25 tires standard, 21.00 x 25 optional,

...is controlled by 4 hydraulic interchangeable hoists

Has only one cable 13 ft. long!

... cutting edge has 4 interchangeable sections!

Blade sections can be reversed easily for double life and positioned for straight or drop-center cutting edge!

... easy accessibility of components cuts downtime!

Clutch replacement in 1/3 the usual time for scrapers...transmission in only 1/8 the time...differential in 1/3 the time!

See your Euclid Dealer...



EUCLID DIVISION General Motors Corporation, Cleveland, 17, Ohio

Let him show you what these cost-cutting features can mean on your jobs...and why owners everywhere have proved that Euclids are your best investment!



Euclid Equipment



#### PRODUCING AGGREGATES . . . continued from page 177

Top Size	CRUSHER SETTING OF 11/2 IN. Percent Pessing Product Size	Product Percent	
1 ½ in	100%	46%	
¾ in			
1/4 in	22% Minus 1/4 in		
	Total	100%	

of 120 tph. This then, becomes the maximum capacity for crushing.

- Next, check charts and tables on percentage of various sizes of product produced by the jaw crusher. (See chart, CM&E, Nov, 1956, p. 164).
- 6. The 65% over 1½ in. will have to be crushed by the roll crusher. This will amount to 65% of 120 tph, or 78 tph. This is satisfactory because the roll crusher will handle up to 143 tph at a 1½ in. setting (see 2 above).
- Next, check the percentages of product from the roll crusher. (CM&E Nov., 1956, p. 163).

 Now we can calculate the tonnages of each size of product from the two crushers, add them together and find the answer.

#### From the jaw crusher

15% of 120 = 18 tph of 1½ in. to ¾ in. 8% of 120 = 9.6 tph of ¾ in. to ¼ in., say 10 tph 12% of 120 = 14.4 tph of -¼ in., say 14

tph

From the roll crusher

46% of 78 = 35.8 tph of 11/2 in. to 3/4 in.,
say 36 tph

32% of 78 = 24.9 tph of 3/4 in. to 1/4 in., say 25 tph

22% of 78 = 17.2 tph of-1/4 in., say 17 tph

Combining

1½ in. to ¾ in. = 18 + 36, or 54 tph
3¼ in. to ¼ in. = 10 + 25, or 35 tph
-¼ in. to ¼ in. = 14 + 17, or 31 tph

Total - 120 tph

Next, we will want to check the capacity of the 4x12-ft three-deck screen to handle the tonnages.

- We can refer back to our tables for various factors to use.
- 2. Factor A is given as 1.00. We do not use Factor C.
- 3. To find Factor D:
  - a. Top deck receives 120 tph from the jaw crusher and 78 tph from the roll crusher, or a total of 120 + 78, or 198 tph. (Recirculation from the secondary crusher could amount to 7 or 8 tons, but can be disregarded in our computations.)
  - b. The amount of material passing through the 1½-in. openings in the top deck is:

From jaw crusher—42 tph from roll crusher—78 tph or a total of —120 tph

continued on page 184

New York 7, N. Y.



Dept. CME, 20 Vesey Street

# EUCLID Scrapers and Crawlers are your best investment



### Overhung engine type Scrapers of 7, 12, 18 yds. struck capacity

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is:

84

Powered by engines of 143, 218 and 300 h.p., these scrapers have heaped capacities of 9, 16 and 25 yds. Advanced design of Euclid's hydraulic lever action, low bowl and 4 section cutting blade provides fast, easy loading. The 18 yd. model has Torqmatic Drive... all have NoSpin differential and Euclid planetary drive axle... unequalled accessibility of the power train and major components.

#### **Four-wheel Tractor Scrapers**

These 12, 18 and 24 yd. scrapers have maximum stability for rough roads and high speed hauls. At 3:1 slope heaped capacities are 14, 20 and 27 yds. A 200 or 218 h.p. engine with 5-speed transmission powers the 12 yd. scraper . . . drive tires are  $21.00 \times 25$  with  $24.00 \times 25$  eptional. The 18 yd. scraper has 300 h.p. with 3-speed Torqmatic Drive . . . standard tires are  $24.00 \times 25$  with  $29.5 \times 25$  eptional . . . a 17 yd. bettem-dump is interchangeable with the scraper. The 24 yd. scraper has a 300 or 335 h.p. engine with 4-speed Torqmatic Drive and  $27.00 \times 33$  tires . . .  $33.5 \times 33$  drive tires are optional equipment.



#### TC-12 Twin-Power Crawler

A completely new cencept in tractor design and performance, this Euclid Crawler has two 218 h.p. engines for a total of 436 h.p. There is a separate Torqmatic Drive for each track. Top speed is 8 m.p.h.—change from one speed range to another or to one of the three reverse speeds is made under full power. Planetary drives can be serviced without removing track, frame or drive sprecket. Operating weight, bare, is 62,500 lbs.



#### Twin-Power "Euc" Scrapers

These scrapers have capacities, struck, of 18 and 24 yds. — heaped at 3.1 slope, 21 and 27 yds. Both models are powered by two engines, each with Torqmetic Drive, and have 27.00 x 33 tires with 33.5 x 33 epitonal. The Model TS-18 has a total of 436 h.p. Tractor of the Model TS-24 has a 300 h.p. engine—scraper wheels are driven by a 218 h.p. engine—a total of 518 h.p. "Twins" outperform other scrapers by a wide margin—they self-lead and work under conditions that stop other scrapers.

Your Euclid Dealer will be glad to provide information on the complete line of "Euc" Rear-Dumps, Bottom-Dumps, Scrapers, and Crawler Tractors

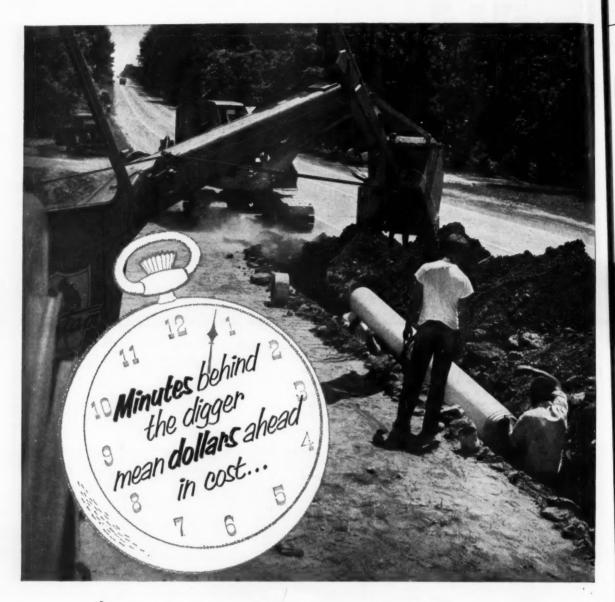
EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



## Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





## ... because Transite® Pressure Pipe goes in fast, pushes the excavator

HANDLING and assembly of Transite Pressure Pipe and the Ring-Tite® Coupling are so simple—and yet so sure—that the laying crew can install the pipe as fast as the trench is opened. This means less time on the job, means appreciably lower costs.

The Ring-Tite Coupling makes consistently tight yet always flexible joints with automatic positioning of pipe ends within the joint. And rubber rings can't blow out.

You can assure city officials and engineers of peak performance, year after year. Transite Pipe, an asbestos-cement product is strong, durable, highly resistant to corrosion.

For further information about Transite Pressure Pipe and Ring-Tite Coupling, write for Booklet TR-160A. Address Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.



#### Johns-Manville TRANSITE PRESSURE PIPE

WITH THE NEW RING-TITE COUPLING



Prescription for Profit ...

## EUCLID S-12 SCRAPER



#### with these pay-off advantages

CAPACITIES

12 cu. yds. struck . . . 14 yds. heaped 3:1 . . . 16 yds. at 1:1 slope.

EFFICIENT POWER

218 h.p. with 5-speed transmission is geared to working ranges . . . top speed loaded is over 21 m.p.h. for fast cycle time.

MORE TRACTION

Standard No-Spin differential eliminates wheel spin . . . 26.5 x 25 tires provide extra traction and capacity.

HYDRAULIC LEVER ACTION FOR SCRAPER OPERATIONS

Fast-acting, trouble-free . . . eliminates downtime and expense of cable replacement. All 4 hydraulic jacks are interchangeable.

MORE MANEUVERABILITY

Push-pull 90° full hydraulic steering for non-stop turns in 31 ft.

MORE EFFICIENT, LONG-LASTING CUTTING EDGE

Four sections are reversible and interchangeable for longer life . . . adjustable for most efficient loading in any scraper material.

LOWER MAINTENANCE COSTS

More on the job availability because major components are easily accessible  $\dots$  clutch and differential can be replaced in 1/3 the usual time for scrapers, transmission in 1/8 the time.

TOPS FOR DEPENDABILITY AND PERFORMANCE

Pay-off performance proved by contractor preference for "Eucs"... the fastest growing line of scrapers in the industry.

See your Euclid dealer for more facts and figures and a production cost estimate on the S-12—you'll find that Euclids are your best investment.

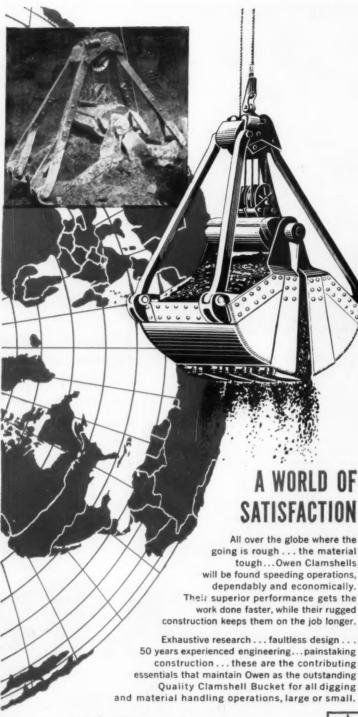
EUCLID DIVISION
GENERAL MOTORS CORPORATION
Claveland 17, Ohio



MORE VERSATILITY...13 yd. (struck) Bottom-Dump is interchangeable with scraper bowl for flexibility to meet changing work requirements with minimum investment in equipment.



Euclid Equipment



Write today and get the convincing facts and latest catalog...all free upon request.

#### The OWEN BUCKET Co.

BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago Berkeley, Calif. • Fort Lauderdale, Fla.



#### PRODUCING AGGREGATES . . .

c. Therefore the percentage which is oversize is:

$$\frac{198-120}{198} = \frac{78}{198}$$
, or 40% oversize

4. To find Factor B:

a. The crushers produce 35 tph of ¾ in. to ¼ in., and 31 tph of minus ¼ in. material, for a total of 66 tph.

b.  $\frac{66}{198}$  = .33 or 33% less than half the opening.

5. Now we find from our table that:

Factor A = 1.00

Factor B = 0.85

Factor C = omit

Factor D = 0.95

Multiplying these factors together;

 $A \times B \times D = 1 \times 0.85 \times 0.95$ = 0.8075

 Referring to our table on crusher run material we find that each square foot of screening area gives us a capacity of 2.7 tph.

8. 2.7 multiplied by 0.8075 gives us an adjusted capacity of 2.18 tph, say 2 tph.

 To handle an output of 120 tph we divide 120 by 2.18, to find we need 55.4 sq ft of screening area.

 Our 4x12-ft screen has only 48 sq ft, therefore it is inadequate.

11. We have two alternatives

1. Feed the plant only 105 tph

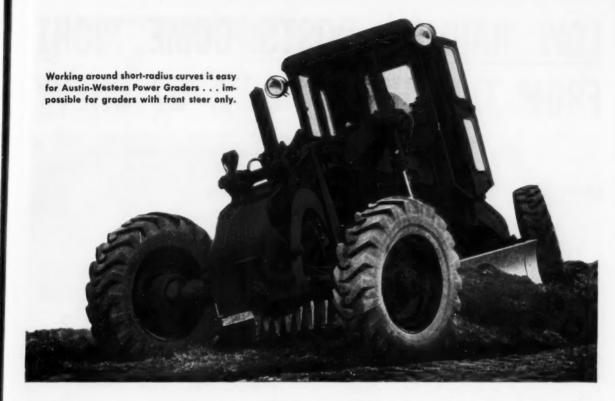
Install a larger size screen, which would be a 5x12 ft.

The obvious answer is the larger screen.

The next article will deal further with stationary plants, particularly with regard to situations requiring surge piles, further crusher and sizing operations, structures, stockpiling, etc.

#### If You Do Paving ...

... You can't afford to be without a set of the 10 Construction Methods articles on how to get the best results with bituminous, concrete, or mixed-in-place paving. All 10 articles in booklet form cost only 50¢. If you order 10 or more sets, you can have them for 40¢ a booklet. Just write to the Editor.



## **AUSTIN-WESTERN POWER GRADERS**

#### Twice as maneuverable...30% more power at the blade

Only Austin-Western offers you the unbeatable combination of all-wheel steer plus all-wheel drive plus torque converter drive in 4-wheel and 6-wheel models. All-wheel steer means top maneuverability . . . you ditch around sharp curves, move dirt up slopes from deep, wet ditches, grade superelevated curves with no gouging or wasting. A-W Power Graders turn around on narrow roads with only one backup, travel quickly and easily where ordinary models cannot go, move the heaviest windrows farther and faster. All-wheel drive means that every pound of the machine is harnessed to a driving wheel - no idling wheels, no lazy front ends to use up power and lower efficiency. Every pound is working weight, contributing 100% to traction, utilizing the whole engine output, de-

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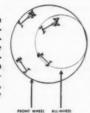
livering maximum power where it counts - at the blade.

Together, all-wheel steer and all-wheel drive make possible A-W's unique Controlled Traction. By offsetting the machine, the operator can put front and rear wheels where traction is best, can eliminate all side-thrust at the toe of the blade (usable over its entire length), and can balance the whole

power of the grader against the load.

In addition, you get unusually versatile blade manipulation, and fingertip management of all blade and wheel movements by full hydraulic control. And A-W Power Graders have the most complete line of time- and laborsaving attachments in the industry. See your nearby A-W distributor. Or write us for detailed information.

The two circles above, with their 62 and 90-ft. diameters, illustrate the difference that all-wheel steer makes. This extra maneuverability saves time on every job, makes it possible to de more jobs—faster, easier and cheaper every month of the year.



All-wheel steer and allwheel drive team up with the blade on A-W Graders —the rear drivers push behind the toe of the blade, the front drivers pull ahead of the heel of the blade. As a result, the machine moves straight ahead under perfect control.



Power Graders · Motor Sweepers · Road Rollers · Hydraulic Cranes

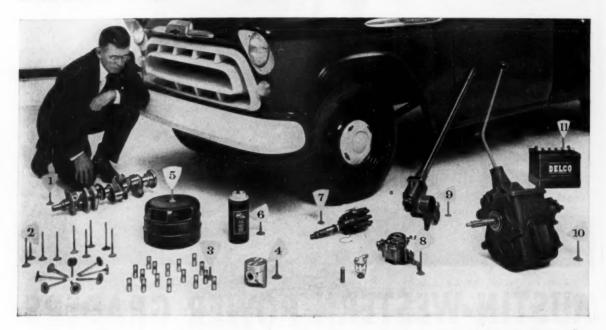


#### AUSTIN-WESTERN WORKS

Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima •
Electronics & Instrumentation • Hamilton •
Loewy-Hydropress • Standard Steel Works
• Madsen • Pelton

AURORA, ILLINOIS, U.S.A.

# LOW HAULING COSTS COME RIGHT FROM THE "HEART" OF A '57 CHEVY



Many of the things that make a
Chevrolet truck more economical to run are
seldom seen by the owner. They're
hidden features, deep in the truck's design.
Here are just a few of them, to
prove a Chevy's engineered better and built
better for bigger savings!

- 1. Forged steel crankshaft—It's extra sturdy, precision machined and balanced, the foundation for dependable, long-lasting power!
- 2. Aldipped exhaust valves \*—Special aluminum treatment on valve surface protects valves against pitting; engine wears less, costs you less to run!
- Hydraulic valve lifters—for longer valve life in V8's, fewer engine repair jobs.
- 4. Chevy V8 piston—Thanks to short-stroke V8 engine design, this piston travels a shorter distance, wears less. Short-stroke efficiency aids fuel economy, too!

- 5. Oil-bath air cleaner—standard on all Chevrolet truck engines for added protection against dust and foreign matter that shorten engine life.
- 6. High-capacity oil filters\*\*—They remove dirt particles from Chevy engine oil to cut engine wear and maintenance.
- 7. Easy-adjust distributor points—You can adjust this new Chevy V8 distributor with the engine running; it's added insurance against costly down time.
- 8. Multiple fuel filters—For clean fuel, all Chevy engines have fuel filters in the carburetor and fuel tank; in addition, V8's provide an extra filter at the carburetor.
- 9. Ball-Gear steering mechanism—Inside this steering gear scores of polished steel balls virtually eliminate friction. Less friction means less wear, less maintenance!
- 10. Rugged manual transmission—Synchro-Mesh design eliminates the need for double-clutching, reduces costly wear. Gears are shot-peened for extra strength.
- 11. 12-volt battery—provides sure starting, good ignition, long battery life in all Chevrolet trucks.
- And there are many more! See your Chevrolet dealer for all the dollar-saving facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.
- \*On Thriftmaster 6, Trademaster V8.
- \*\*Standard on V8's and Johnaster, optional on Thriftmaster 6.

## 1957 CHEVROLET TASK-FORCE TRUCKS

PROVED ON THE ALCAN HIGHWAY ... CHAMPS OF EVERY WEIGHT CLASS! CHEVROLET





On any pavement job, you can

### BREAK IT UP and FINISH IT UP

in record time with this R



OMBINATION

#### 1 An I-R GYRO-FLO COMPRESSOR of the right capacity

With the complete line of Gyro-Flo rotary compressors, there's no need to haul around or pay for any more air power than you actually need. Now available in 85, 125, 210, 315, 600 and 900 cfm sizes, you can pick a unit with the right capacity to operate as many or as few paving breakers as the job calls for. That means no idle compressor capacity - no overloading that cuts tool pressure and slows up the work. What's more, GYRO-FLO's proved performance assures a smooth, dependable air supply that's tops in fuel economy and remarkably free from attention or maintenance.

#### 2 I-R PAVING BREAKERS of the right weight and power

Ingersoll-Rand offers you the most complete line of paving breakers and accessories available today. From the big, heavy-duty, 100-lb Breaker and Pile Driver to the lightweight 20-lb Demolition Tool and Digger - you can match the tool to the job. Use only the weight and power you need - reduce operator fatigue and save air power cost. In addition, I-R paving breaker steels and accessories, designed and built to stand up longer on the toughest jobs, are available for every breaking and demolition application.

Ask your I-R representative for the complete facts on this time-saving Contractors' Combination.

Ingers

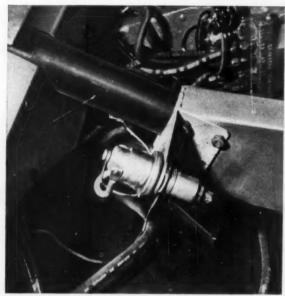
AIR EQUIPMENT FOR BETTER HIGHWAYS

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# The Engineer's Field Report

CASE HISTORY
Chevron Pressure
PRODUCT Primer System
Consolidated Freightways Inc.,
FIRM Portland, Oregon

## Pressure Primer System starts diesels on 1st or 2nd turn with regular batteries — at minus 40°



BELOW ZERO starting temperatures are common 5 months a year for Consolidated Freightways equipment operating in Mountain and Plain States. Two hundred and forty-four of the company's tractors are equipped with the Chevron Pressure Primer System. Since this installation, rigs start on first or second turn at  $40^{\circ}$  below zero—using regular equipment batteries! Normally in these sub-zero temperatures, regular batteries give out after about 4 turns. Sure starts plus the fact engines are primed with Chevron Pressure Primer bulbs, controlled from

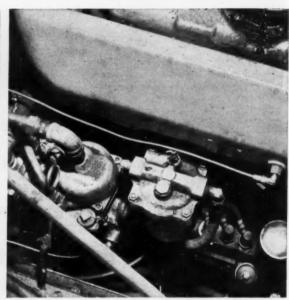
FREE FOLDER tells you more about Chevron Pressure Primer System and how to install it on different engines. Write or ask for

it today.



PRADEMARK "CHEVRON" REG. U. S. PAT. OF

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies listed below.



within the cab, saves Consolidated Freightways important man-hours and speeds operating schedules. Picture above (left) shows a Chevron Pressure Primer Discharger mounted on steering column. Highly volatile priming fuel is atomized through tubing into manifold (right) under 250 lbs. pressure.

#### Why Chevron Pressure Primer System helps starting

Volatile Chevron Priming Fuel atomizes in induction system at temperatures as low as -65°F. Pressure or weakest spark from engine fires mixture.



Simple, rugged discharger prevents fuel leakage. Small, safe steel bulbs protect fuel from water and dirt.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

#### Construction Men in the News . . .



W. J. ROHAN



W. E. KIER



EDWIN M. WHIPPLE



BEN ARP

#### **Beavers Make Second Awards**

The Beavers, an organization of western construction men, presented awards to 11 leaders in the field for "outstanding contributions and meritorious service" at its second annual Golden Awards dinner in Los Angeles. Those honored were:

#### In Management

W. J. Rohan, president of Winston Bros. Co., and W. E. Kier, president of W. E. Kier Construction Co.

During a construction career that spans 51 years, Bill Rohan has played a vital part on many big jobs both as an executive and as an operations supervisor. Some of his jobs are the harnessing of Montana's Mystic Lake to a hydro-electric program by blowing a hole in the bottom of the lake and channeling the outsurge through a tunnel to the penstock, laying a 20-in. pipeline across 225 mi of mountain country in 89 days, and constructing a World War II shipyard that turned out more than \$254 million of invasion ships.

Ernest Kier started in construction in 1898 with the J. W. Atkinson Co. of Colorado Springs, Colo. He moved to the west coast in 1912 to found his own firm in partnership with his brother, Elmer. In joint

ventures with other firms, the Kier firm participated in the construction of Coolidge Dam, Grand Coulee Dam, San Diego Naval Hospital, and other major projects. He is one of the founder members of the Associated General Contractors of America and has served the organization as a director.

#### In Supervision

Edwin M. Whipple and Ben Arp. Before his retirement in 1950, Ed Whipple had an active construction career of 45 years. He served as superintendent for a number of major construction firms on such projects as Pardee Dam, Big Tujunga Dam No. 1, Eleven Mile Canyon Dam, Morris Dam, Saw Pit Dam, and Narrows Dam. He also was superintendent for TVA on construction of the Chickamauga Dam in Tennessee and assistant superintendent on the Norris and Pickwick Landing Dams. For several years before his retirement he was associated with Bechtel Co.

Ben Arp is known as an outstanding tunnel man. He went to California in 1906 to help build the Western Pacific Railroad and got his first taste of tunnel work. Soon after he joined Utah Construction Co. and become superintendent on several of the large tunnels that Utah drove for Kennicott Copper Co., Pacific Gas & Electric Co., Nevada Irrigation Co., and the Metropolitan Water District of Southern California, among others.

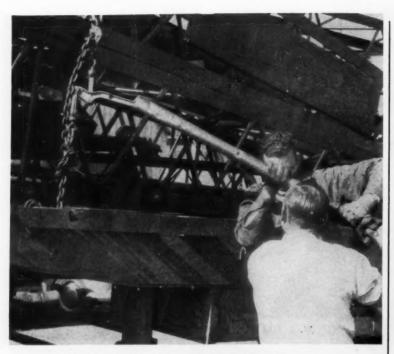
#### Other Awards Went To:

In Engineering: Augustine H. Ayers, consultant of Woodside, Calif., and Otto W. Peterson, for 30 years Manager of the General Construction Department of Pacific Gas and Electric Co.

In Supply: A. F. Garlinghouse of Garlinghouse Bros., construction equipment dealers, and A. J. Gock, formerly Chairman of the Board of the Bank of America.

Special: William A. Johnson (awarded posthumously), first president of the Beavers and former president of American Pipe and Construction Co., Lt. Gen. Samuel D. Sturgis, Jr., former Chief, U.S. Army Corps of Engineers, and Robert B. Diemer, General Manager and Chief Engineer of the Metropolitan Water District of Southern California.

continued on next page



## THIS LOAD WILL STAY PUT ... ACROSS TOWN — ACROSS COUNTRY

There's no doubt about the safety of this load—or any load secured with Lebus Loadbinders. Completely drop forged, then heat treated for even more strength and durability, the millions of Lebus Loadbinders already in use have proved their ability to tie down loads of every description—keep them absolutely secured without failure until they're released!

You get an idea of this loadbinder's strength from the photo above. Two big truckers throw their combined weight on a long cheater without fear of breaking or bending any part—they know that, from handle to hooks, the Lebus is the strongest Loadbinder manufactured. You're assured of safe, dependable performance because each Loadbinder is thoroughly proof tested before shipment.

Equally important is the Lebus Loadbinder's convenience and safety of operation. Once the binder is locked in position, it can't snap open. Even shifting loads won't spread the handle! Exclusive Lebus designed ball and socket swivel is drop forged—won't pull apart regardless of the load! Get complete details on the number one loadbinder in every industry from Crosby Laughlin Lebus Distributors!

#### WORKERS PROTECTED

Workers and materials are protected with Crosby-Laughlin Safety Hooks that keep the load in place *until it's* released! A rust-proof, non-jamming latch and spring provides a simple but safe method of keeping rings and slings



on the hook, even when the load is set down! Tough Crosby-Laughlin Hooks are drop forged then carefully heat treated. The result is superior strength and quality from a design that eliminates excess weight. Crosby-Laughlin safety and standard hooks are available in eye, hoist, shank and swivel types to give you the exact design you need. Capacities range up to 20 tons! See your nearby distributor for catalogs and technical information on a complete line of fittings!

World's Most Complete Line of Fittings For Wire Rope and Chain

### **CROSBY LAUGHLIN LEBUS**

FORT WAYNE 1, INDIANA

CONSTRUCTION MEN ...



JAMES DONALD McKINNEY is the new general manager of the recently established Pittsburgh district office of Intrusion-Prepakt, Inc., Cleveland concrete construction contractors.

McKinney has been with I-P since 1954 serving as superintendent engineer for concrete placement on such projects as Garrison Dam, Mackinac Bridge, Tarrytown Bridge, and others.

Prior to 1954 he served as assistant department engineer for Metcalfe, Hamilton, Smith, Beck Companies. He also worked on engineering projects in Alaska, Iceland, Cuba, and Turkey. He served with the 2nd Army during World War II.

WRIGHT M. PRICE will be resident manager of construction on the Kaiser Engineers International, Inc., contract to build a complete water supply and distribution system for Asuncion, the capital of Paraguay. The multi-million-dollar contract represents the largest single project ever undertaken in the country.

Price has served for the past year as chief construction engineer on construction of an automobile plant at Cordoba, Argentina. He joined the Kaiser organization in 1932 during construction of Hoover Dam and served as field engineer during the \$120 million expansion of the Fontana facilities of Kaiser Steel.

continued on page 194

## Meet the New OLIVER OC-46



#### designed exclusively for loader work



The Jet-Trencher, powered by hydraulic loader system, can be mounted or removed in 90 seconds. This great combination can handle many different jobs.

The new Oliver OC-46 offering 5/8-yd. capacity is available only as a complete loader unit. With wide 46" gauge track and greater track length, it gives you the extra stability to use full power at all times. You can work steadily at top speed with the heaping bucket loads that pile up production faster.

Here's extra mobility, too, with 4-speed transmission ranging from 1½ to 5¼ m.p.h.—a change of pace to meet every need. Maximum drawbar pull is 4200 lb. You'll find it the

easiest operating crawler you've ever known with smooth hydraulic controls, velvety clutching, comfortable box-type operator's seat and modern low silhouette that permits maximum visibility. Its years-ahead design means greater earning power for you.

There's still more cost-cutting news for you in the new OC-46. See it and operate it yourself. Call your Oliver Distributor for a demonstration—today!

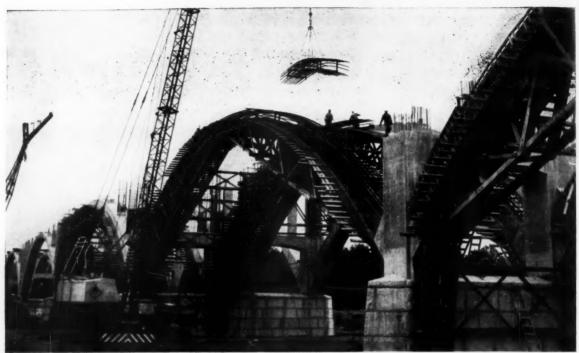
#### THE OLIVER CORPORATION

400 W. Madison Street, Chicago 6, Illinois



a complete line of industrial wheel and crawler tractors and matched allied equipment

February 1957 - CONSTRUCTION METHODS and Equipment - Page 191



Construction of the reinforced-concrete arches of the bridge carrying the new Route 22 By-Pass over the Schuylkill River at Hamburg, Pa. General contractor: F. D. Kessler, Inc., Northumberland, Pa. Bridge contractor: J. Richard Nissley, Inc., Landisville, Pa.

### Two New Highway Bridges in Pennsylvania

Shown here under construction are two important new highway bridges in Eastern Pennsylvania. One (see cut at right) is a bridge near Lehighton, Pa., over Pohopoco Creek and the Lehigh River, with spans of 920 ft and 1500 ft, respectively. This bridge is part of the Northeast Extension of the Pennsylvania Turnpike, running from Philadelphia to Scranton.

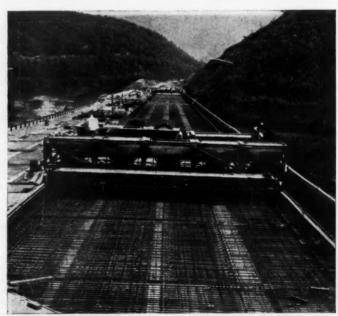
The other bridge (above) carries an extension of the Route 22 By-Pass over the Schuylkill River near Hamburg.

For the road beds and approaches to both these bridges, Bethlehem supplied a substantial tonnage of highway steels. These steels include dowel units and bar mats, deformed reinforcing bars and accessories, hook bolts and guard rail.

Have you seen our big illustrated booklet, "Steel for Highways"? It describes fully the complete Bethlehem line of road steel products. Contractors find it informative and helpful. You can obtain a copy by writing either to Bethlehem, Pa., or to the nearest Bethlehem sales office.

#### BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Pouring the road bed of the Pohopoco Creek-Lehigh River bridge on the Northeast Extension of Pennsylvania Turnpike. Contractor: J. Richard Nissley, Inc., Landisville, Pa.

#### BETHLEHEM STEEL



## MODEL DB-60 Vhiteman **POWER BUGGY\***

**NEW** easy steering and control. Ball bearing is adjustable for wear.

**NEW**, improved parking brake is located within easy reach.

NEW, sturdier construction of seat bracket gives added strength.

NEW, larger, stronger steel guards give operator added protection. \_

NEW, heavier solid-casting rear frame makes Power Buggy\* huskier, more rugged than ever.

> **NEW** type wheel-clutches engage instantaneously, insuring smooth starts.

> > Now-place concrete faster, easier, cheaper than ever with the great new Whiteman Model DB-60 Power Buggy. Sturdier, more dependable than ever with many outstanding improvements plus the

many important features that have made Whiteman the standard of the construction industry. Call your Whiteman distributor today or send coupon now for complete details.

REAL

RUGGE and rarin' to go!

\*Trade Mark

Whiteman





WHITEMAN MANUFACTURING CO. DEPT. C 13020 Pierce St., Pacoima, Calif.

Please send prices, catalogs and name of distributor for Power Buggles | Screeding Machines | Vibrators Floating-Finishing Machines | Truck Mixers.

Zone State.

# FLECO Manufacture of the second clearing





Fleco Rock Rake equipped with Top Guard. Note how this can approximately double the height of load.



Fleco Rock Rake with Top Guard and Wear Caps. Note how rake fits on bulldozer frame — it's interchangeable with the blade.

## See what a well-dressed land clearing tractor should wear!

The Fleco Rock Rake is your basic equipment that can double the capacity of your crawler tractor! A Fleco Rock Rake carries a considerably larger load than a bull-dozer blade. It takes out small trees and brush—roots and all—that a blade skims over. It outproduces a bulldozer for piling or stacking stumps or larger trees.

The Fleco Rake combs through the top foot or so of soil, raking out roots, limbs or rocks that interfere with scraper or other dirt moving equipment. Correctly shaped teeth roll the load, sifting out dirt. Material is stacked in dirt-free piles for clean burning and easy disposal.

Bolt Top Guards to the Rake frame – like the upper right illustration – and you'll further increase the carrying capacity of your rake and give added protection to the tractor. Slip Fleco Wearing Caps on the tooth points to prolong tooth life in abrasive conditions.

Your Fleco-Caterpillar Dealer has a complete line of specialized land clearing equipment to help you cut your clearing costs and boost production. His recommendations can make a big difference in the way you bid your jobs and the money you make. See him soon!

### FLECO

Jacksonville, Florida

ROCK, ROOT & BRUSH RAKES
TREE CUTTERS · UNDERCUTTERS
CAB GUARDS · ROOT CUTTERS
DETACHABLE & PULL STUMPERS
TREEDOZERS · ROLLING CHOPPERS
HEAVY-DUTY TOOL BARS



#### CONSTRUCTION MEN IN THE NEWS... continued



HENRY MEYERS is presidential nominee of the Concrete Contractors Association of Chicago. The nomination—tantamount to election—was made during the association's convention in Mexico City. He will succeed Bert Carey, president of Bert Carey & Co., who held the post five years.

Other nominees are HENRY STEIGERWALDT, vice president, and EDWARD McCARTHY, secretary-treasurer. Highlight of the convention was the formation of a national concrete contractor's association to foster improvements and extension in the use of concrete throughout the country.



J. P. CAGLE is the new president of the Southern California Chapter, Associated General Contractors of America. The chapter is the largest of the national association's 122 member groups. Elected with Cagle were J. W. BERNARD, D. E. KELBEY, J. M. SAWYER, vice presidents, and W. F. MAXWELL, treasurer. Cagle, an expert on flood control projects, is a vice president of A. Teichert & Son.

Raves for no ravin' beauty...



## "What a beating! But in 12 years, trucks have never had a lubrication failure!"



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a sts

FOX RIVER'S MIGHTY MACHINES all provide trouble-free performance using Cities Service Gasolene, Diesel Fuel, and Lubricants. These outstanding products help the company operate at 150 tons per hour.



THAT'S DUST, BROTHER! This motor, buried in dust, is typical of operating conditions at Fox River Stone Company. Yet, using Cities Service Pacemaker Oil, there's never been a bearing failure. Never any lubrication problems.

Fox River Stone Company, Elgin, Illinois, reports trucks wear out externally, are still good internally using Cities Service Lubricants.

Operating at the rate of 150 tons per hour under the toughest conceivable quarry conditions, Fox River Stone Company produces barn and agricultural lime, 2" and 3" stone for road construction, "A" and "B" binder for asphalt road construction, flagstones, and a host of other crushed stone products.

Yet, during the last 12 years, there's never been a lubrication failure of any kind in any piece of machinery using Cities Service Lubricants.

With the aid of Cities Service Gasolene, Diesel Fuel, and Trojan H-2 Multi-Purpose Grease, Fox River's many shovels, pay loaders, and trucks have given constantly flawless performance. And despite the extremely dusty quarry conditions, exposed electric motors have never lost a bearing using Pacemaker 150 T Lubricating Oil.

Not one lubrication failure in any of this equipment during 12 years of rugged operation! That's Fox River's record with Cities Service and it can be your record when you start using Cities Service Products. For information, talk with your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES ( SERVICE

QUALITY PETROLEUM PRODUCTS

## GENERAL NYGEN

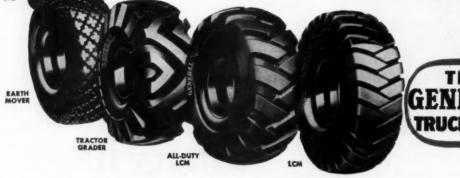


...built tougher for the toughest jobs!

#### Featuring Stronger-than-Steel NYGEN® CORD

Designed to make every off-the-road job show a profit, big, rugged General Truck Tires are built to take brutal punishment . . . built to out-perform any other tire on any project. Unexcelled for strength with exclusive Nygen Cord construction and delivering dependable tractor-like flotation and traction, Generals provide the ultimate in job-hazard protection. Their job performance records prove Generals best!

specify GENERALS on your new equipment



THE GENERAL TIRE & RUBBER CO. . Akron, Ohio

Page 196 — CONSTRUCTION METHODS and Equipment — February 1957

HCT

### The Maintenance Shop ...



TWO-WHEEL engine-driven welder isn't fancy, but it enables contractor to get welding power into the field when and where it's needed. Most components come from old auto.



FOUR-WHEEL trailer carries big generator and rebuilt auto engine equipped with idler, governor, and gravity flow fuel tank. Components are bolted and welded to rigid base.

#### Make A Portable Welder

INGENUITY and a fertile scrap heap can provide an inexpensive but extremely valuable addition to any contractor's maintenance plant —an engine-driven welder on wheels tailor-made to suit your needs.

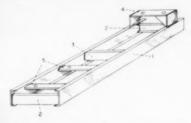
If an old truck or car with an engine still good enough to be re-

built is available, the only major investment will be for the welding generator itself. Most other parts, including wheel assemblies, springs, the coupling, and material for the base, canopy, trailer, and gasoline tank, can be fabricated from parts of the vehicle or from the scrap heap.

After studying more than 100 of these job-built rigs, the Lincoln Electric Co. has come up with a composite plant for a portable welder that highlights good construction features and eliminates most trouble spots.

To build a rig that will give smooth running and trouble-free performance, Lincoln suggests that the builder follow one basic rule: Don't skimp to save materials or to reduce the final weight and size or the rig.

This is especially true when designing the base. It is much better to use more metal than is actually required than to use too little. The beefed-up frame of an old car can be used, or this base can be built from pipe, and H or I-beams:



The side members (1) are generally made from channel sections with an 8 or 10-in. web size. End sections (2) consist of standard channels, or H or I beam sections with web sizes slightly less than that of the side members. End sections also can be made of 34-in. flat plate or 4 or 6-in. dia pipe.

The center brace (3) is an important part of the base construction because it is required to take most of the engine torque. For this reason, it should be located as close as possible to the coupling between the generator and the engine. Use heavy channel, plate, or pipe sections at least as thick as the end sections. The raised section (4) of the base is for the radiator. Fabricate it from 1/2-in. plate, and brace it to fit the radiator. The other cross pieces (5), with pre-drilled holes for bolting down the engine and generator, will vary in spacing to fit these components, as will the overall length of the base. It is a good idea to allow additional room besides that needed for the generator and engine for storage.

Assure the dependability of your welder by choosing an engine with a rating sufficient to drive the generator uniformly. It is not neces-

#### MAINTENANCE SHOP . . .

continued from page 197

sary to use a new engine, but it pays to rebuild an old engine before installing it in the rig. To drive its Shield-Arc generators, Lincoln recommends that engines have the following minimum horsepower rating:

Amp	RPM	Model	Engine Hp.	
200	1800	57034	24	
300	1800	57042	35	
400	1500	S7051	45	
600	1500	S9604	60	

Because the rig will be stationary when the welder is being used, the cooling system will not be as effective as it would be if the same engine was powering an automobile or truck. For this reason, the radiator must be larger than the one normally used with the engine.

Install the gasoline tank—which can be welded from sheet metal—so that it is higher than the engine. By placing the tank on an angle iron frame near the top of the canopy, the tank will provide gravity flow to the engine, and it will not be necessary to use a fuel pump.

An engine-driven welder needs a governor to maintain the constant

engine speeds necessary for smooth arc performance. Several easy-to-install varieties are available. When ordering a governor be sure to specify whether the carburetor is updraft or downdraft. Also give complete engine information and specify the type of generator you plan to use. Suitable governors can be purchased from several manufacturers.

A welder also needs an idling device, which will soon pay for itself in gasoline and oil savings and in reduced engine downtime. Lincoln offers a simple idler that reduces engine speed to about half of normal when the welder is not in use, and then opens up the throttle when the operator strikes the welding arc. It is easy to install and adjust.

You can either build your own coupling or purchase a good one for \$20 to \$40. If you purchase a coupling, it will be necessary to make up a flange plate. The coupling is bolted to the flange plate, and the flange plate is bolted to the flywheel. Lincoln will supply detailed plans to anyone who wants to build his own coupling.

Whether you make it or buy it, the coupling must be the flexible type, and it must have the capacity to transmit enough constant engine torque to power the generator uniformly. It is important to double-check the alignment of the engine and generator shafts. Don't trust your eye, but check the alignment with an indicator. After the welder and generator are bolted in place, it is a good idea to tack weld them to assure rigidity.

When designing your canopy, remember that its main purpose is to protect the welder's components from the weather. Don't overstreamline the canopy. The more room you have under the hood, the easier it will be to get at the engine and generator for servicing. It is also a good idea to allow room for a tool chest and accessories.

Home-made canopies usually consist of steel supporting posts with a steel top and sheet metal or canvas side covers. If you have torn down an old truck or automobile to make the welder, you have a good source of sheet metal for the side covers.

An old vehicle will supply almost all the parts needed for the trailer. Depending on the size of the components, the trailer can be a single or a double-axle carrier.



## These pumps guarantee you lower-cost water handling on any job!

Whether it's a job requiring high suction lift —or a run-of-the-mill seepage problem—CMC Pumps have exclusive features that provide dependable workhorse performance you can count on

CMC Hi-Pressure centrifugals with auxiliary primer are well suited for water supply, jetting operations or any job where pressure is a factor.







New, FREE, Just-off-the-press
CMC Pump Catalog
Write for yours today!

CONSTRUCTION MACHINERY COMPANY, Waterloo, lowa



## Now... most power of the low-priced 3 New DODGE **PowerGiants**

#### 1957 line-up gives you up to 232 hp.

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Dodge tops the low-priced field in V-8 power by a big margin-actually delivers as much as 31% more! This extra power in reserve saves engine strain . . . wear . . . excessive repairs. What's more, Dodge V-8's use regular gas, help keep your cost per ton-mile down!

Extra payload capacity. You can haul more -up to 73% more in the 300 model pick-up, for example.

Extra handling ease. Exclusive push-button automatic transmission\*! Sharpest turning and easiest steering in the industry!

See the new Power Giant line-up now at your Dodge dealer's. You'll see features that prove it pays to get your Dodge dealer's deal before you decide on any truck. \*Available on all low-tonnage and Forward-Control models.

#### DODGE TRUC

WITH THE FORWARD LOOK







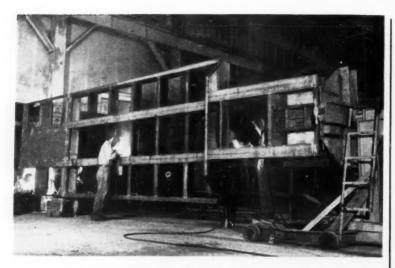
Stakes

#### **DODGE** meets your hauling needs!

Conv.	Max. G.V.W.	Max. G.C.W.	Max. V-8 HP.
100	5,100 lbs.	_	204
200	7,500 lbs.	-	204
300	8,800 lbs.	-	204
400	15,000 lbs.	26,000 lbs.	197
500	18,000 lbs.	32,000 lbs.	197
600	21,000 lbs.	35,000 lbs.	197
700	23,000 lbs.	45,000 lbs.	216
800	25,000 lbs.	55,000 lbs.	222
900	30,000 lbs.	65,000 lbs.	232
Ferward-Cont	rei Medels		
P300	9,000 lbs.	_	204
P500	15,000 lbs.	***	204
C.O.E. Model	1		
C500	18,000 lbs.	32,000 lbs.	197
C600	21,000 lbs.	35,000 lbs.	197
C700	22,500 lbs.	45,000 lbs.	216
Tandem Mode	rfs.		
T700	32,000 lbs.	45,000 lbs.	216
T800	36,000 lbs.	55,000 lbs.	222
T900	46,000 lbs.	65,000 lbs.	232



Tractors



## 100% "DOWN-WELDED" for your protection



One weak weld in the main frame of a low-bed trailer can cost you hundreds of dollars in down-time and repairs if it happens to "let go" with an expensive shovel or tractor aboard!

That's why LaCrosse fabricates its trailer frames in giant frame-positioners, which revolve the entire frame, so all welding is performed in the most favorable downward position. This special LaCrosse method of quality control insures much stronger, more uniform welds than are obtainable with ordinary methods used by most low-bed manufacturers.

LaCrosse also forms all of its trailer main beams — without cutting either flange — so you get continuous beam strength from stem to stern. This patented method also gives you far more strength in the gooseneck, where most of the jolting, twisting strains occur in low-bed operation. See your LaCrosse distribing the many additional quality features of LaCrosse low-beds — from 6 to 75 tons capacity. LaCrosse Trailer Corp., LaCrosse, Wis., U.S.A.



Most popular low-bed in the field is the 24-ton capacity LaCrosse DF6T tandem because it hauls a bigger variety of loads ANYWHERE — without permit complications. Weighs only 8800 lbs. with flat deck.



LaCrosse also builds four different types of single and tandem-axle tilt-trailers — from 6 to 22 ton capacity — for fast, one-man loading and having of small tractors, shovels, etc., behind trucks or 5th wheel tractors. LC-40

Heavy metal fabricating since 1865

"Better Living Through Better Roads"

ALUE LEADER IN LOW-BED TRAILERS

#### Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

#### **Distributors**

Ramset Fastening System, Olin Mathieson Chemical Corp.: Cameron & Barkley Co. has been named a distributor for Ramset powder-actuated fastening tools and the Shure-Set hammer-in fastening tool. The Jacksonville, Fla., distributorship, which also handles Blaw-Knox, Link-Belt, Republic Steel, and Yale & Towne, is headed by Rufus C. Barkley.

Euclid Div., GMC: Blackwood Hodge Equipment, Ltd., formerly called Innes Equipment, Ltd., is the new dealer for the complete line of Euclid earth-moving equipment in the province of Ontario, Canada. The distributor's main office is in Toronto and a branch office is located in Port Arthur. The new dealer is the Canadian division of Blackwood Hodge, Ltd., of London—one of the world's largest equipment distributors.

Chrysler Corp.: The Power Tractor Co., Oxnard, Cal., has been appointed a dealer for Chrysler industrial engines. The new distributorship is headed by R. M Power.

#### On the Sales Front

Frank G. Hough Co.: G. A. Tamblyn, sales manager, has announced the appointment of Robert L. Knox and Herman R. Brown as assistant sales managers. "The increased demand for Payloader equipment, which has necessitated our current plant expansion, has also made it necessary for us to reorganize and broaden our sales department," Tamblyn said. Knox had been a district sales representative and Brown was formerly manager of the order and distribution section of the sales department.

LeTourneau - Westinghouse Co.: C. R. Martin is the new district representative in the western half of Pennsylvania and the state of West Virginia. He will work with the following LeT-WesCo distributors: Equipped with snow plow, your Adams can open heavy drifts, keep roads clear for winter traffic. Adams V-type Snow Plows, Snow Wings, and propeller-type "Snow-Blo" attachments can keep your graders busy during winter months...keep your taxpayers happy!

## Why 15 speeds

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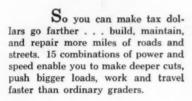
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#### in a motor grader?



That is why modern Adams 80 to 150 hp machines give you 8 standard speeds forward and 4 reverse, plus 3 creeper speeds (optional), for a total of 15 speeds . . . all operating through full-constant-mesh transmission. Range of the 123 hp Adams 550, shown in chart below, is typical,

#### Wider range of forward speeds match power to load

For ditching, scarifying, bank work, oil-mixing, spreading, and general maintenance, Adams provides 4 efficient working speeds. Other graders, with 6 forward speeds, have only 3 working speeds. Here's an example of what this means in operation: Adams moves a given load in 3rd gear at 4.6 mph, using full horsepower. With a 6-speed grader and the same load, your operator would have to drop back to 2nd gear,  $3\frac{1}{2}$ -4 mph . . . or go to 3rd gear where he would have to cutback the throttle, thereby losing



power. It's like that on every operation . . . Adams wide speed-power range gets more work done faster every day, the year 'round.

Adams' two intermediate speeds, 10 and 14 mph, come in handy for blading of snow, maneuvering, and climbing tough grades. Travel speeds to 25 mph move rig quickly from job-to-job. Adams foot accelerator and dual braking action make high-speed travel on the highway, or in traffic, as easy and safe as driving a truck.

#### Reverse speeds to 13 mph save time on shuttle grading

Most graders have only 2 reverse gears, with speeds to about 3 and 7 mph. Adams has 4 reverse gears . . . 2 for working, 2 for high-speed backup. Again, this wider range of speeds gets more work done, uses engine power to full advantage.

But it's Adams' 3rd and 4th reverse speeds that pay the big dividends! Many times your operator works a 200' to 400' stretch or even more. It's too short to make turn-around worthwhile . . . so he backs-up. Adams' higher reverse speeds of 8 and 13 mph get the grader back to its starting point fast . . . convert wasted travel time to production blade work. These

speeds are also useful for backing up to buck snow drifts, and for fast maneuvering.

#### Creeper gears extend grader's working range

Three optional creeper speeds are available, as original equipment, or as an extra which can be added in the field. These gears are in the low-low range of operating speeds, 0.25 to 1.76 mph. They afford a means to concentrate full engine power for ripping up old roadways, pulling stumps, and working through rocks and roots. Creepers eliminate the necessity for "slipping the clutch" at high RPM to get steady power at slow speed . . . reduce shock and clutch wear. Creepers also make it possible to cut more accurate grades, and work in tight places.

#### Get more for your money

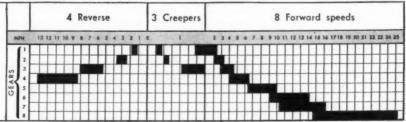
Adams graders cost no more than competitive graders of similar size and power. Yet Adams enables you to give your constituents more and better roads, at less cost.

It will pay you to specify "15 speed availability essential" on your next grader. Write for full details now on Adams Snow Plow equipment.

Adams—Trademark SPAG-48-P-b

#### Work speed range Adams "550"

Speed range is shown between RPM at which maximum torque is obtained, and RPM at which maximum engine horsepower is developed.





LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Bits of Crucible Silicon-Manganese alloy steel shown in holder. They are produced by McLaughlin Manufacturing Co., Inc., Joliet, Illinois.

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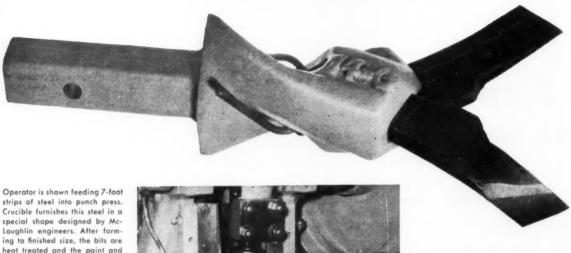
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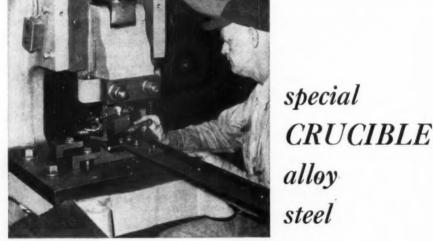
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cutting edge are sharpened by hand.



#### gives bits maximum impact and abrasion resistance . . .

Cutting through abrasive materials like coal, soft limestone and shale demands a special steel. A steel that's hard without being brittle - that will take and hold a keen edge.

That's why Crucible produces a special Silicon-Manganese type alloy steel for the McLaughlin Manufacturing Co., Inc., manufacturers of these bits. It's a steel designed for optimum shock and abrasion resistance.

After McLaughlin tested Crucible's special alloy in the coal fields, their verdict was "This Silicon-Manganese steel is the finest alloy steel available.'

Crucible will be glad to produce a special steel to meet your particular needs, too. Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.



first name in special purpose steels

Crucible Steel Company of America

#### SALES AND SERVICE ...

A. T. Green Machinery Co. of Pittsburgh; Walsh Equipment Co of Butler, Pa.; and West Virginia Tractor and Equipment Co. of Charleston and Clarksburg, West Virginia. The territory which Martin will serve has been newly created as a result of increased equipment and parts sales in the area.

Thor Power Tool Co.: Martin A. Bertram, formerly a service engineer, has been appointed manager of Thor's new Great Lakes electric tool sales zone. The Great Lakes zone is the fourth set up by Thor in the last 12 mo.

General Tire & Rubber Co.: Barney L. Crowe has been promoted to manager of the newly formed Charlotte, N. C., sales division. In his new position, Crowe, formerly assistant division manager at Atlanta, will supervise sales of General tires, tubes, and batteries in North and South Carolina and in most of Virginia.

Minneapolis-Moline Co.: A major expansion of the industrial sales staff is announced by Robert R. Greenwalt, vice president for sales. The expanded staff will be headed by E. A. Henry, manager of the firm's Industrial Power Div. Minneapolis-Moline has increased its line of industrial and utility wheel tractors, and recently announced a crawler tractor. David S. Hansen, Jr., is sales manager in charge of dealer sales. George W. Balch is a new eastern regional sales manager, George W. Balch, Donald R. Kendall, John G. Seibel, Robert F. Osborne and John Knudson are district representatives.

#### In the Main Office

Avco Lycoming: The appointment of three men as presidential assistants recently has been announced. The three men and their duties are: Turner A. Duncan, industrial engine manager; Edward L. Woodyard, administration; and Paul A. Deegan, public relations and advertising. Since 1954, Duncan has been president and a member of the board of Turner Mfg. Co.

H. H. Robertson Co.: Dr. A. W. Coffman recently was named president of Robertson's \$50 million-a-yr operation in the U.S., Canada, and Great Britain. He moves up from executive vice president to

Does Steam Cleaning Pay?



Tricycle mount with zero pressure tires makes this Malsbary 250 HPC easy to move around shop or yard. You get the explosive 325° F. solution at 300 lb. pressure needed to quickly remove sticky tars, mud and corrosive greases.

#### Yes, if you're using Malsbary HPC, users report:

Shortens downtime—"In winter, heavy equipment comes in covered with ice, frozen mud, hard grease and grime—tough to get off, but 2-gun Malsbary 300 HPC really does a dandy job on it. In other seasons, it's heavy grease and mud, but Malsbary speed on cleaning and degreasing parts, engines and heavy rigs enables us to set up a tight maintenance and repair schedule."... Savin Construction Co., user of 7 Malsbary HPC cleaners at different job sites.

Gets rid of road oil—"Our Malsbary 250 saves cleaning time, repair time, re-assembly time. It removes road oil—a job we couldn't do with our previous cleaner."... Empire Equipment Co.

Improves worker performance
—"You can't clean all the 'crud' off
by hand. Anyhow Malsbarys do it
so much more easily. We find our
mechanics like to work better on a
clean tractor. When you send a
clean, painted, repaired-like-new
machine back out to work, operators treat it like new, too."... Peterson Tractor & Equipment Co., user
of 5 Malsbary HPC cleaners.

#### What HPC Means to You

Malsbary High Pressure Combination cleaners combine pumped hydraulic and thermal pressures (an exclusive, patented feature), deliver a 300-400 lb. cleaning blast, at temperatures 100° F. higher than any other cleaner...and they do it on a 24-hour, 7-day week, if necessary. This combination cleans 4 to 10 times faster than most other cleaners and at 1/2 to 1/5th the cost. Cleaning construction rigs is a tough task requiring both the pressures and high temperature you get only with Malsbary HPC.

Why waste time and money with limited capacity cleaners when you can do so much more, faster and better with HPC? Ask your Malsbary dealer for a demonstration (see yellow pages of phone directory), or write us now for free literature.

103



Room C2, 845-92nd Ave., Oakland 3, Calif.



Increase profits, reduce costs with EFCO "Lifetime" Steel Forms. They save time, material, money. Adaptable to wide use. Available in many types of regular and special sizes.

WRITE FOR CATALOG on EFCO "Lifetime" Steel Forms. And ask for details on Special Economy Steel Forms and the Economy Steel Form System on a rental basis.

#### Economy Forms Corp. DES MOINES, 10WA

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Offices in St. Louis. Mo.: Kansas City, Mo.: Lincoln. Nebr.: Minneapolis, Minn.: Ft, Wayne, Ind.;
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Decatur, Ga.: Charlotte, N. C.; Dallas Texas; Tuisa,
Okla.: Houston, Texas; Los Angeles, Cal.: Oakland,
Cal.; Denver Colo.



#### PORTABLE POWER PLANTS

Right — you save time . . . Right - you speed work . .

because with Katolight Portable Power Plants your crews have "plug-in" elec-Decause with natoright provided by Plants your crews have "plug-in" electricity instantly available to operate all types of tools, equipment and lights right on the job, whether it's highway, or light or heavy construction. Sizes and models, right for every portable, standby or continuous use from 350 watts to 50 KW, AC. Up to 500 KVA on request.



#### SALES AND SERVICE ...

continued

replace Dr. J. H. Young, who retired Jan. 1. Dr. Coffman also will serve as a member of the board of directors of Robertson, one of the nation's leading manfacturers of building construction products. He is only the third president in the 50-yr history of the company. He holds the degree of Doctor of Philosophy in chemistry.

Clark Equipment Co.: Claud A. Fenn, Clark vice president, has been appointed to a newly created position on the president's staff to coordinate manufacturing operations in all Clark plants. In his new capacity, Fenn will be accountable for all property, buildings, equipment, and manufacturing policies and procedures. He started with Clark in 1934.

Allis-Chalmers Mfg. Co.: Boyd S. Oberlink, group vice president of Allis-Chalmers, was elected recently to the firm's board of directors. He was elected a group vice president in Jan. 1956. Prior to that he was vice president and general manager of the Construction Machinery Div. He joined the company in 1934.

#### Special Mention

Caterpillar Tractor Co.: The dramatic story of the planning and development of the St. Lawrence Seaway is told in documentary style in a new color and sound film called "The Eighth Sea." Walter Cronkite, television commentator, narrates the film. The film is available for use through the nearest Cat dealer or by writing the advertising division.

#### Associations

Asphalt Institute: R. O. Wilson, recently elected chairman of the board of the Institute, assumed active responsibility for the job at a recent board meeting in New York City. He succeeds Sidney Goldin of the Shell Oil Co. Wilson is associated with the Cosden Petroleum Corp., Arlington, Texas. The Institute maintains administrative offices and laboratories at the U. of Maryland, College Park, Md. The Institute also announced the appointment of two new district engineers. They are Claude F. Skidmore, who will cover Michigan and northern Indiana; and Fred N. Finn, who will work out of the Sacramento, Cal. office.

#### Just Out

#### How to handle all types of plumbing jobs

No need to waste time puzzling over plumbing code regulations. This practical handbook explains them in simple, clear language - and uses diagrams, tables, and photographs to make sure you grasp every essential point.

Although very new. the Code already has been adopted by 12 states and hundreds of municipalities. Contractors and plumbers more and more will find it valuable to have handy the kind of clear explanatory guide to Code regulations given in this book.

in strict accordance with the National

Plumbing Code



#### National

#### **Plumbing Code** HANDBOOK

Standards and Design Information Edited by Vincent T. MANAS, Consulting Eng'r 503 pages, 389 illustrations, \$7.50

THIS handbook offers a clear, simple guide to the National Plumbing Code, explaining and illustrating its meaning and intent, paragraph by paragraph, and including much related tech-nical information and data to aid in the design and installation of plumbing, water supply, sew-age, and drainage systems that will meet Code standards.

Gives you safe, sanitary standards for

- · joints and connections
- . trans and elegnouts
- plumbing fixtures
- · hangers and supports
- mobile homes
   vents and venting
   storm drains
   waste piping
   interceptors
   sloping drain capacity

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ROLL UP PRODUCTION with help like this . . .

EXCLUSIVE "ROLL-AWAY" MOLDBOARD . . . moves tough dirt fast

NEW TOGGLE-TYPE CONTROL . . . kick-free in the rough . . . pinpoint accuracy at the blue-tops

HIGHEST AXLE AND THROAT CLEARANCE in its class . . . for better handling of biggest loads

TOUGH TUBULAR FRAME . . . shock-absorbing strength down the middle

BOX-SEAT COMFORT AND VISIBILITY . . . satisfied operators . . . more and better work done on all grading jobs ROLL-AWAY is an Allis-Chalmers trademark.

These are five of many reasons why Allis-Chalmers FORTY FIVE motor graders are showing up in more and more top construction organizations. They're precisely what you dirt-moving specialists ordered . . . ready now to help you handle the big road-building years ahead. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

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Engineering in Action

### Construction Equipment News ...



#### Crawler Drill Works At Any Angle

Thor's new rock drilling crawler, called the MM-2 Drillcat, mounts the Thor 105M drifter rock drill and the BW-2 wagon drill mast on crawlers that are equipped with twin 71/2-hp air motors. The rig can drill vertically, horizontally, of at any angle. The Drillcat features a hydraulic boom that raises and lowers the mast, and centralized controls that permit one man to drill, feed, and blow out holes at full line pressure. The mast has an adjustable chain tensioning system and heavy duty shock absorbers. Another feature is a steel centralizer that makes it easier to start a hole. The Drillcat is 63/4-ft long, 6-ft wide, and it weighs 3,-000-lb. Boom is 3 2/3-ft long .-Thor Power Tool Co., Aurora, Ill.

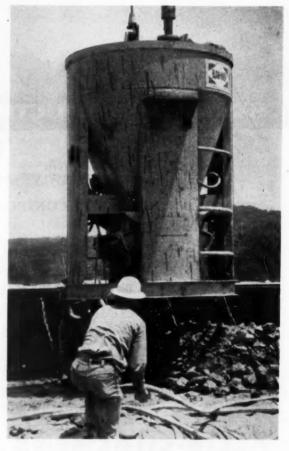


#### ▲ Payloaders Mount 4-in-1 Buckets

Any of Hough's four-wheel-drive Payloader tractorshovels now can be equipped with a Drott 4-in-1, a multi-purpose bucket that performs a variety of jobs: as a shovel it acts conventionally; as a clamshell, it performs clean-up chores, carries pipe, etc.; as a scraper, it loads, carries, spreads, or dumps; as a dozer it offers finger blade-pitch control of depth of cut.—Frank G. Hough Co., Libertyville, Ill.

#### Bucket's Weight Operates Gates ▶

Blaw-Knox's new 4-yd concrete bucket uses its own weight to generate hydraulic pressure for operating its discharge gates; no air lines or other external power source is needed. The open and close time for the hydraulic bucket's discharge gates is said to be much faster than that for air-operated buckets. The company will introduce 2, 3, and 8-yd hydraulic buckets.—Blaw-Knox Co., 300 6th Ave., Pittsburgh, Pa.



#### Transports Big Loads Over Bad Terrain

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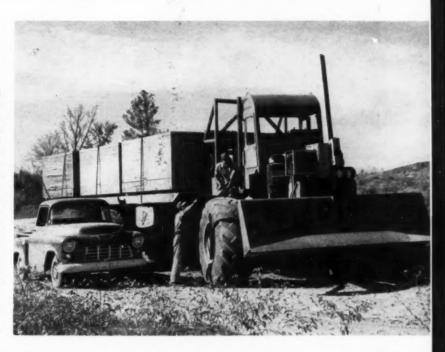
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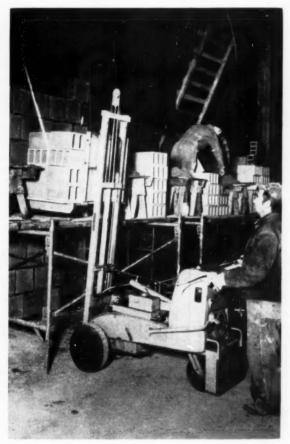
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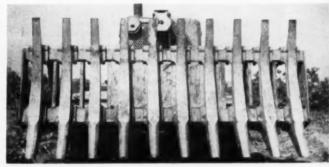
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R. G. LeTourneau's massive but light-footed Transporter can carry 35-ton loads over terrain that previously was off limits for freight haulers. The rig is equipped with low-pressure tubeless tires that provide 600 sq in. of ground contact per wheel. DC electric motors are geared directly to each wheel. making them individual drive units. Should one wheel lose traction, its horsepower is automatically transferred to the others. Power for the dc motors, and for the ac motor used for steering, is supplied by two generators driven by a 335-hp diesel engine. The Transporter is 38-ft long, 131/2-ft high, and 12-ft wide. The cargo platform is 25x12-ft.-R. G. Le-Tourneau, Inc., Longview, Texas.







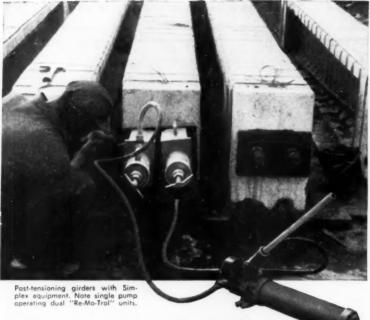
#### ▲ D9 Gets Rugged Clearing Tool

The Fleco D9 rake, available in straight or angling models, utilizes the Cat D9's power for land clearing jobs. Its design allows the number of teeth to vary from 5 to 10, with equal spacing, to suit job conditions. The standard rake, weighing 9390 lb, has 10 teeth. The angle model is 14½-ft long and the straight rake is 13-ft 5-in. long. Teeth penetrate down to 17½ in.—Fleco Corp., Jacksonville, Fla.

#### **◄ Fork Lift Built for Builders**

Prime-Mover's new fork-lift unit is designed to handle materials on building jobs. It can lift two 100-brick packages or equivalent 1,000-lb load 6½ ft in 6½ sec. The unit measures only 31½-in. wide, and the mast tilts back to pass under 62/3-ft high doorways. The fork lift can be removed quickly from the chassis and replaced with a 10-cu-ft dump bucket or flatbed.—Prime Mover Co., Muscatine, Iowa.

Continued on next page



## Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custombuilt units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure,

SIMPLEX "JENNY" is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.



TEMPLETON, KENLY & CO.

2509 Gardner Road . Broadview, Illinois



FIRST AID-The Davis Oxygen Inhalator has been designed so that even a relatively inexperienced first-aid man can use it with safety. Because it can be pre-set for normal breathing, it is necessary only to turn on the cylinder valve to begin oxygen therapy. The kit is extremely light and compact so that it can be carried virtually anywhere. It consists of a plastic facepiece and breathing bag, an oxygen diluter, 4 ft of hose, a cylinder adaptor, and two cylinders containing a 1/2-hr's supply of oxygen. To conserve oxygen, the rate of flow can be adjusted to the patient's breathing.-Davis Emergency Equipment Co., Inc., Newark, N.J.



POWER STEERING UNIT-R. H. Sheppard Co., manufacturers of diesel engines and power steering gears for industrial applications, has developed a new full-time power steering gear that can be installed on any current model Huber-Warco Maintainer. The new gear, a completely integrated unit, is offered in kit form. Installation is an easy operation that requires drilling five holes and enlarging a hole of the maintainer's mechanical gear. There are only two hydraulic lines to connect -a pressure line and a discharge line .- R. H. Sheppard Co., Inc., Hanover, Pa.

BLOCKS AND SHEAVES—Durolite blocks and sheaves, the same kind used on Sauerman Drag-Scraper machines and cableways, are now available as separate items. Durolite sheaves are said to be lighter than other sheaves of the same rated capacity, but they have the structural strength to handle heavy loads at high speeds



### make the nearest "U.S." Sales Office your port of call!

Whatever your conveyor belt needs may be—your convenient "U. S." District Sales Office is your supply point. Here's what it offers:

- The most complete line of belts available
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The "U. S." belting engineer will show you the unique "U. S." conveyor belt kit which enables him to build, right before your eyes, a miniature sample of the right type and size of belt to fit your needs.

So whether you're involved with long hauls and heavy loads of ore, oats, or aggregate—or small distances and light weights, such as peas, packages or parts—contact any of the "U. S." offices listed below. Or write us at Rockefeller Center, New York 20, N. Y.

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United States Rubber



## Leading Fleet Owners Depend . . . on Manitowoc

All over the country leading contractors have come to depend on Manitowoc for big, steady production, rugged service and long-life. Dozens of repeat sales to fleet owners prove that superior Manitowoc performance leads to additional orders when the purchase of new machines is considered.

Manitowocs are the choice of successful contractors because there's greater utilization of engine power through direct power flow to the dipper. As a result, operating cycles are faster . . . help to finish jobs ahead of schedule. This simplicity of design cuts down on the number of moving parts, keeps downtime negligible. Smaller rigs in the line offer greater weight with the lowest cost per pound of machine in the industry. Larger units like the 5½-yd. Model 4500 shown above have the beef and brawn needed for the big, tough jobs, yet are as mobile as a small excavator. Best of all, quality of Manitowoc construction matches quality of performance.

Join the growing list of earthmoving men who pick Manitowoc for profit. Before you bid your next job be sure to investigate all the Manitowoc advantages — you'll be glad you didn't settle for less! Manitowoc Engineering Corp.

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Lee Corporation Arthur G. McKee and Co. Merritt-Chapman & Scott Corp. Morrison-Knudsen Company, Inc. American Bridge Division, **U. S. Steel Corporation** Bechtel Corp. C. F. Braun & Co. Clemens Construction Co. Construction Aggregates Corp. E. I. DuPont de Nemours and Co. Foster-Wheeler Corp. Heckett Engineering Co. Walsh Construction Co. Stone and Webster Engineering Corp. Utah Construction Co. M. W. Kellogg Co. Koppers Co., Inc. Peter Kiewit & Sons Co. Massman Construction Co. McDowell Co., Inc. Medusa Portland Cement Company **Dravo Corporation** Geo. M. Brewster & Son, Inc. Brown & Root, Inc. Whitehead & Kales Co. Raymond Concrete Pile Company United Engineers & Constructors. Kaminski Brothers, Inc. The Lummus Company Booth & Flinn Co. Chicago Bridge & Iron Company Altoona Construction Co. The A. Bentley & Sons Co. O. W. Burke Company Bushman Construction Co. Nicholas Fornabai

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without slipping or spinning Sheaves are available in sizes from 6 to 18 in. in alloy steel, and in 20 to 24-in. sizes in cast steel. Durolite blocks feature end-thrust bearings that cut down on side frame wear, and free-moving swivels for easy positioning. They are available from stock in sizes from 6 to 18 in. with bronze bearings, and from 8 to 42-in. sizes in roller bearings. Sizes up to 54 in. can be furnished on special order.-Sauerman Bros., Inc., 620 S. 28th St., Bellwood, Ill.

24-YPH CAPACITY - The new Fairfield model 618B 40-ft portable concrete conveyor unit includes a swivel chute belt wiper. and concrete hopper as standard equipment, and it can be obtained with head end control for starting and stopping the belt. The 18-in. wide belt, which runs on triple troughing-type idlers, has a selfcleaning pulley on the foot end. While capacity varies with the slump of concrete used and the discharge height, the conveyor is rated at 24-yph, at 16-ft discharge height. The unit can be raised to 26 ft.-Fairfield Engineering Co., Marion, Ohio.



PIPE BENDERS—Blackhawk has introduced a new line of 3 and 4-in. hydraulic pipe and conduit benders. The new models are styled after Blackhawk's popular smaller benders which handle pipe from ½ through 2-in. sizes. The four new benders come with Blackhawk's Optik-Angle gage that makes it easy to make accurate 180-deg bends without guess-



#### **CUT BUILDING COSTS IN CALIFORNIA**

...with prestressed concrete double T slab floors, ceilings and roofs!

Southern California's phenomenal growth coupled with the nationwide increasing building costs prompted Rockwin Prestressed Concrete Corporation to investigate and install FORM-CRETE double T casting forms in their Norwalk plant to provide needed construction savings in the area.

The building illustrated is one of several in the Los Angeles area designed by architectural associates Jack H. McDonald and Cejay Parsons (one of Rockwin's many customers) utilizing economical prestressed double T concrete slabs for floors, ceilings and roofs.

We, the Florida Division of FMC, are pioneers in the engineering, design and fabrication of prestressed concrete poured-in-place and semi-portable flat-bed steel forms for producton line casting of every type of prestressed construction product. In addition, we offer a free engineering and design consultant service for your steel form needs in custom fabrication on specialized projects.

Investigate the highly profitable new market in the prestressed concrete product field with its unlimited applications...write, wire or phone today—get into the prestressed concrete business now with FORM-CRETE steel casting forms!



# Supermarket spans years of construction progress... USES Ramset!



Using the latest construction methods, contractors completed Eavey's Supermarket in Fort Wayne, Indiana, ahead of schedule and ahead of budget!

The electrical contractor reported hanging 10,000 feet of conduit carrying 350,000 feet of wire, with RAMSET, using 100,000 fasteners for the job. About \$10,000 and two full months were saved by using speedy RAMSET SYSTEM, according to George Clement, service engineer for Eavey's. Other contractors saved in the same way.

companion tool

Supermarket

#### Shure-Set

Baby brother to RAMSET, this hammer-in tool uses no cartridge, but makes your own ham mer power more effective. For masonry, mortar joints, cinder block. Ask for literature. RAMSET FASTENING SYSTEM can be used in a variety of ways on most jobs: electrical, plumbing, air conditioning, door, window and wall installations. Moreover, RAMSET is just as valuable in the plant maintenance operation as to the original builders and contractors.

You can anchor almost anything to concrete and steel with RAMSET. New catalog is ready, send for your copy now.

#### Ramset Fastening System

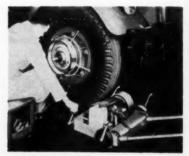
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#### **EQUIPMENT NEWS...** continued

work. The new 3-in benders can make a 90-deg bend with just one stroke of the ram, and only three setups are required to make 90-deg bends on 4-in. pipe. All models are built of rigid aluminum and have removable top plates.—Blackhawk Mfg. Co., Milwaukee 46, Wis.



WHEEL BALANCER - A new self-centering, on-the-truck wheel balancer drastically reduces the time normally required to balance truck wheels. It is designed so that it can be attached quickly and simply to almost any size wheel without removing the wheel from the truck. Bolts attach to the wheel and lock it in position so that it can be spinned at any desired speed. A 5 or 71/2-hp spinner rotates the wheels at the best speeds to provide accurate balancing. The unit consists of a balancer with a run-out gauge, vibration indicator. and wheel-weight tool; a spinner; and a stool with storage space.-John Bean Div., Food Machinery and Chemical Corp., Lansing 4, Mich.



TRUCK-MOUNTED BACKHOE—Shawnee is now offering an integrated truck-mounted backhoe. The carrier can be any four-wheel-drive, slightly modified standard truck, with a power take-off at the transmission for driving the hydraulic system of the backhoe. The truck is equipped with a frame that accommodates either the Chief or Warrior backhoe. The Chief has a digging depth of 15 ft and the Warrior has a digging

### 30 mph "C" hauls shovel rock



Babler Brothers, Eugene, Oregon, used "C's" with rear-dump bodies on this 160,000-yd. 7-mile relocation of U.S. 99 near Anlauf. All-steel body easily withstood shocks of loading big-chunk rock. Short 14'4" turn radius speeded positioning at both shovel and dump.

#### with 22-ton rear-dump

Here's just one profitable use for versatile, 208 hp electric-control C Tournapull prime-mover. Coupled to 22-ton reardump trailing unit, this 30 mph primemover becomes a big-production hauler. Rig can be operated at top speed, with complete safety, because it has 3763 sq. in. braking surface - more on one wheel than most haulers have on all four. Holding action of powerful 4-wheel, disc-type air brakes, plus front-wheel drive, let it back safely to edge of bank, dump load clear to save dozer clean-up. Simple electric hoist (no troublesome hydraulics) tips body to vertical position. Smooth, clean, streamlined bowl clears loads instantly. Big 8'9" x 10'10" top opening speeds loading from shovel, dragline, or loader . . . reduces spillage. When you have no shovel work, money-saving interchangeability with scraper doubles Tournapull's earning capacity.

### ... then converts for scraper dirt

#### with 18-yd. scraper

For less than 25% of the cost of original unit, rear-dump body interchanges with a low, wide 18-yd. Fullpak LeTourneau-Westinghouse electric-control scraper. All you need is the scraper body - wheels, tires, brakes, and controls can be switched. This substantially reduces the cost of unit interchangeability. Big 24.00 x 25 tires, all-around, assure ample flotation in mud. Constant-pull, power-transfer differential also reduces weather delays . . . gives positive traction on soft banks and slick grades. Thus, scraper and rear-dump keep your "C" prime-mover earning all year 'round. Other auxiliary hauled units -including a 16-yard Bottom-Dump, 20ton Flat-Bed and 20-ton Crane - further save time and reduce equipment investment per job. This money-saving Tournapull package is available also in larger and smaller sizes. Write today for facts on performance, price, and delivery!



Brown and Lambrecht, Joliet, Illinois, used their 3 "C" prime-movers with fast-loading 18-yd. Fullpak scrapers, for widening 7 miles of U.S. 66 near Chicago. Units moved 180 pay yards of clay and topsoil hourly over 3-mile cycles. Scrapers can be interchanged with rear-dumps.

Tournapull-Trademark Reg. U.S. Pat. Off. Fullpak-Trademark RP-1332-G-b



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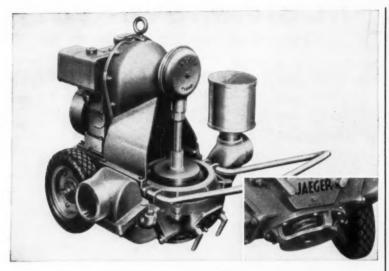
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LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT



#### New Jaeger Diaphragm Pump

(1) Unique spring-bottom bowl prevents build-up of clay or cement deposits and protects from shock if stones enter pump. (2) Light, free-swinging valves give minimum resistance and quick, tight closure. (3) Surge chamber eliminates "kick", doubles hose life. (4) Quick diaphragm change — loosen 4 bolts and tilt back. 4" model pumps up to 7000 gph at 10' lift, 4000 gph at 25'. Also built in 3" size. See your Jaeger distributor or write.

The Jaeger Machine Company, 800 Dublin Ave., Columbus 16, Ohio
AIR COMPRESSORS • CONCRETE MIXERS • PAVING MACHINES

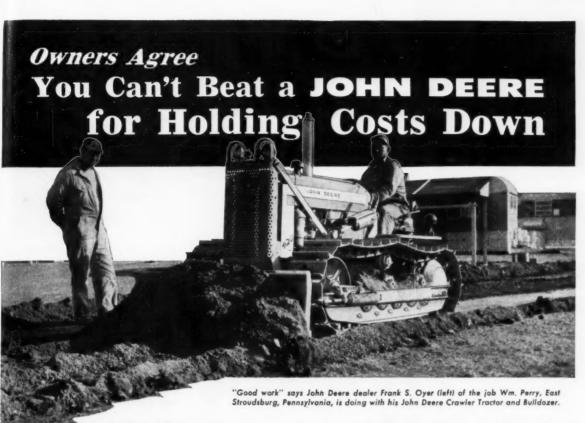


depth of 12 ft. Both are designed on the "push-pull" principle, with hydraulic cylinders synchronized —but operating in reverse directions—on either side of the axis pin. Both models operate in three 120 deg quadrants.—Shawnee Mfg. Co., 1947 N. Topeka Ave., Topeka, Kans.



BUAL SOCKET—The Wright Tool & Forge Co. has introduced a new dual purpose socket that will fit both square and hex nuts interchangeably. This means that a mechanic tightening a ½-in. hex nut can also fit his socket wrench on a ½-in. square nut. All sockets are forged from chrome alloy steel and they have a polished chrome plate finish. The first "Ten Point" socket is a ½-in. square drive, but others will soon be available in ¼, ¾, and 1-in sizes. — Wright Tool & Forge Co., Barberton, Ohio.

REDESIGNED SAWS - Black & Decker has redesigned its line of portable electric saws to make them more powerful, easier to handle, and safer. The line now includes the No. 63, which cuts to 2 5/32 in. at 90 deg; the 73, which cuts to 2 7/16 in.; the No. 83, which cuts to 2 13/16 in.; and the heavyduty No. 93, which cuts to 31/4 in. at 90 deg. Power has been increased on all models by an average of 25% and cutting speeds also have increased. The safety features now include a switch guard to prevent accidentally tripping of the instant release trigger; an automatic telescoping blade guard with large lift



**Doing the job efficiently...** on time... has been a John Deere tradition for nearly 120 years.

But the big feature of modern John Deere mobile work units that always brings a smile of satisfaction to the owner, is the real, measurable dollars-and-cents saving he makes in initial cost, operating cost, and maintenance.

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Industrial
Tractors and Equipment

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> Backed by nearly 40 years of tractor manufacture for dependable service and quality.

Mr. Wm. Perry, above, for instance, is well pleased with the way the John Deere handles his light construction work and topsoil business. But he uses the word "amazed" when he talks about its fuel economy. He owns a John Deere No. 963 Trailer with hydraulic brakes for transporting the unit, and is considering the purchase of a second John Deere tractor outfit.

The John Deere "420" Crawler with loader (left) is owned by Arthur Depue, also of East Stroudsburg. This combination is used to break shale loose from its natural formation to be used for roadbed fill. It's a severe test for any outfit, but both tractor and loader are giving excellent service on this rugged work. George Brands, the operator, says he never worked with any other tractor that has the fuel economy of the John Deere. He states that he uses only 9 gallons of gas in 10 hours of continuous maximum load operation!

Your John Deere dealer will be glad to give you more information on John Deere mobile power—crawler or wheel-type. You'll find his name in your classified directory.

#### SEND FOR FREE LITERATURE

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Please send me free literature on the John Deere "420" Crawler.

Name\_

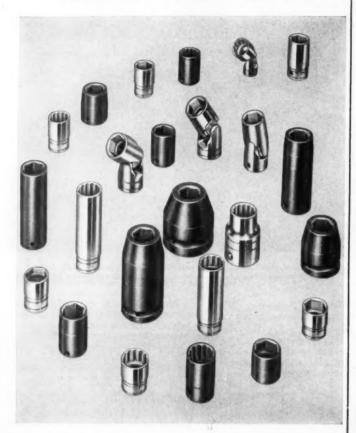
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# Snap-on sockets to drive just one size nut?



yes—and here's why: Every ¾-inch socket shown here solves a particular industrial nut-running problem. Snap-on makes this variety of ¾-inch hex wrench sockets and many more sizes and styles to give you just the one you need to match the job you have to do. Standard length, bolt clearance length, magnetic, Flexockets, power, power-impact and thin-wall types let you choose the socket to do your job faster and more efficiently, with less breakage.

or maintenance problem involving special socket design or application, or any other question on tools, talk it over with your *Snap-on* man. He is a specialist who devotes all his time to industrial application of *Snap-on* tools. Write us or call your nearest *Snap-on* branch. Free catalog of industrial wrenches and hand tools is yours for the asking.

### SNAP-ON TOOLS CORPORATION

8042-B 28th Avenue • Kenosha, Wisconsin

\*Snap-on is the trademark of Snap-on Tools Corporation.



EQUIPMENT NEWS... continued



lever; an open-end handle for quick release; and a three-conductor cable for grounding. With diecast aluminum housings, the smallest saw weighs 11 lb and the biggest saw weighs only 15¾ lb. The saws are fully adjustable for both depth and angle of cut, and there is a clearly calibrated quadrant for setting off any angle up to 45 deg. A "picture window" view of the blade is provided at all times.—Black & Decker Mfg. Co., Towson 4, Md.

Soevilde



HYDRAULIC CRANE truck-mounted Versa-Lift model 400 crane will lift 3500 lb with a standard 16-ft boom, or 7000 lb with an 8-ft boom. Minimum load clearance is 6 ft when the boom is horizontal. The boom, which is powered by a PTO-driven hydraulic pump, will swing a full 360-deg circle. The Versa-lift, which weighs about 3900 lb, takes up only 22 in. of space between the truck cab and the bed. Hydraulically operated outriggers protect the truck frame and add stability when the load is swung to either side of the truck. The new crane can be mounted on any standard truck of at least 1/2-ton capacity without modification .- Teale & Co., Omaha, Neb.

continued on page 219

# Contractor Takes Tractair to Church and Solves Unusual Construction Problem

Remodeling of this large church depended on plenty of air power.

"Inside" job was confined, crowded, with poor footing.

Here's how a construction firm found the answer with a Le Roi Tractair.

A self-propelled Le Roi Tractair compressor went to church recently to help the Caspian Construction Company of Caspian, Michigan with an unusual air-power problem.

The job was different and difficult. St. Mary's Church in Wausau. Wisconsin was to be remodeled inside, from the ground up. Plenty of air power was needed to work essential tools. But long hose wouldn't work because of friction loss and danger of abrasion from debris. Not even small trucks could get inside the building.

To solve the problem, a Le Roi 125 Tractair, capable of working in crowded conditions . . . maneuvering in tight corners . . . "stepping" through loose, deep sand, was

engines. Write today for information about any of these products.

driven into the church. In this way continuous air power was provided for the job, without tying up additional equipment or men.

The contractor states, "The Tractair was a life-saver on this job, due to the fact that it is so mobile. It did a very fine job for us and served all of our needs at a very low cost of operation."

Ready to work at any job. Tractair, a combination 42-hp wheel tractor and 125-cfm air compressor, can be equipped with a variety of drilling attachments, front-end loader, backhoe, rotary sweeper, backfill blade, and operates Le-Roi-Cleveland air tools - rock drills. pavement breakers, clay spades, backfill tampers.

On this job, the Tractair functioned as a specialized tool providing a complete answer to the need for dependable air power inside the church. The Le Roi Tractair was also used outside the church to break concrete, along with a portable Le Roi Airmaster compressor. On many jobs, the Tractair can replace a truck-towed compressor with a 50% saving in equipment costs and manpower and unlimited savings in time.



(Above) Work outside St. Mary's church in Wausau, Wis., used Le Roi Tractair and Le Roi Airmaster compressor to break concrete.

(Below) Inside church, Le Roi Tractair provided air power when and where needed because it can move about in confined, crowded places.



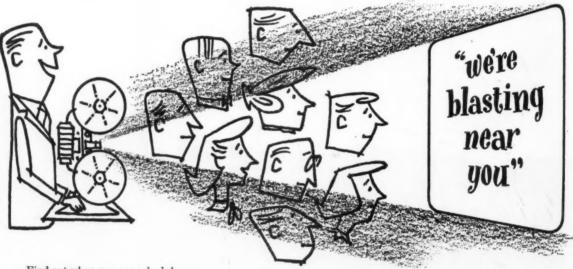
Here's a new, effective way to aid your public relations in the communities where you are blasting. It's the interesting, informative sound film in color, entitled, "We're Blasting Near You."

This movie tells why blasting is necessary, and the steps you are taking to be a "good neighbor." It shows how millisecond delay techniques eliminate the old fashioned, jarring explosions of the past . . . how modern blasting methods hold noise to a muffled minimum and make vibration unnoticeable.

"We're Blasting Near You" can be shown to any age group: schools, service clubs, civic organizations. It is accompanied by a kit which includes suggested news releases, a sample introductory speech for the person presenting it as well as safety posters, and other helpful material. Show this unique new movie in your area. It can be an important help to you.

# New film ...

# builds goodwill for users of explosives

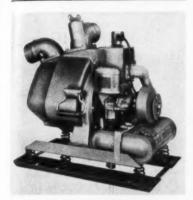


Find out when you can schedule "We're Blasting Near You" in your community. And ask for "Better Blasting," the Atlas newsletter on latest methods and materials.



offices in principal cities

#### **EQUIPMENT NEWS...** continued



28-FT SUCTION LIFT - Homelite's new centrifugal pressure pump has a capacity range of from 55 gpw at 70-lb pressure, up to 205 gph at open discharge. Weighing only 107 lb, the pump has a guaranteed suction lift of 28 ft and a total head of 185 ft including friction. The self-priming pump, called the model 24S3-1P, comes with 3-in. suction and discharge fittings. It will develop pressure in 15 sec at 5-ft suction lift, and 45 sec at a 15-ft suction lift. The pump is mounted directly on the crankshaft of a singlecylinder, air-cooled, two-cycle Homelite gasoline engine. A protected, high-tension, flywheel-type magneto assures easy, quick starts in any kind of weather .- Homelite, Port Chester, N. Y.



IMPACT DRILL—Pneumatic impact action for drilling in concrete brick, and masonry can be obtained with any ¼-in, electric drill when it is equipped with a new attachment. The attachment, only 6-in. long by 1½-in. dia., will drill ½-in. holes 3-in. deep in con-

# ERIE STRAYER USED BUCKET LOADS 500 TONS OF SLAG DAILY



ERIE rehandler shown charging hopper of rotary drum dryer unit of the Gregg County Barber-Greene Asphalt plant.

# BUCKET CABLE IN USE MORE THAN A YEAR AT ASPHALT PLANT, GREGG COUNTY, TEXAS

W. R. Scroggins, County Engineer for Gregg County, Texas knows just why we can claim that ERIE BUCKETS WORK BETTER—LAST LONGER.

In 1951, his Gregg County Highway Department bought an ERIE bucket for their Barber-Greene 840 Asphalt Plant. And it was a USED bucket—one that had already seen several years service!

Today, four years later, Mr. Scroggins reports: "For seven months now our Erie bucket has handled 500 tons of slag daily. It's been more than a year since we've even had to change the cable."

Here's one more example of the ERIE bucket's rugged dependability. Whether it be loading sand, moving scrap, or digging clay and gumbo, the ERIE works better—longer!

#### These features make ERIE the bucket experienced operators prefer:

- 1. Top closing power from block and tackle, plus lever arm construction, plus precision balancing.
- Manganese steel teeth and high carbon steel lips that bite up full payloads of even toughest clay and gumbo.
- 3. Rigid, one-piece, welded head that shrugs off bumps and jars. No shimmy. No wobble.
- 4. Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.
- 5. Low headroom for fast work in tight quarters; low center of gravity for easy positioning.



For catalogs, write Dept. CM27

# ERIE STRAYER CO.

1227 GEIST ROAD

ERIE, PENNSYLVANIA

# WET JOBS

### IS THIS A RECORD FOR DEWATERING SILTY SAND & CLAY?

Concrete box culvert, Old Bridge, N. J. Contractor: Almeida Construction Co.



PHOTO, JUNE 1—Griffin equipment shipped that day. Difficult swampy soil required use of specially designed sand filters around the wellpoints.



JUNE 4. Wellpoint system installed over weekend and excavation well under way. Actually, the 5 ft of water was under control just 20 minutes after pumping started.

That's how skillfully the filters were designed. P. S. Almeida called Griffin on the recommendation of a contractor friend. Ask your friends about Griffin.

# GRIFFIN

### WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y. Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.
Terento Montreal Halifax

#### **EQUIPMENT NEWS...** continued

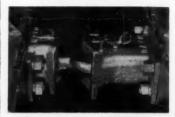
crete in 30 sec., according to the manufacturer. The attachment employs a 25-lb pre-loaded spring and two rotating cams to deliver 2 blows per revolution. It develops up to 90.000 fpm impact force. Any standard carbide drill from 7/8 to 1/4-in, can be used. The attachment takes a 1/2 in. drill shank, but sleeve bushings to take 1/4 and 3/8in. shank diameters are available. The attachment, which has only four moving parts, weighs only 11/2 lb. It sells with a lifetime guarantee for \$15.50.—Power Tools Corp., 1425 Lakeside Ave., Cleveland 14. Ohio.



IMPACT CONTROL - The new Ramex air hammer is a low-cost unit that provides full range control-from a light tap to a powerful blow-for drilling, chipping, riveting, caulking, or cutting jobs. It has only one moving part plus the trigger button that regulates the force of the blow. Even though the trigger is pulled, the hammer allows sufficient time to position the tool end properly. The action will not start until the tool touches the work, and as soon as it loses contact with the work the hammer action stops. Weighing only 41/2 lb, the hammer uses only 6.3 cfm of air, making it possible to use 1-hp compressors.-E. V. Nielsen, Inc., 129 Broad St., Stamford, Conn.

NEW IH ENGINES — International Harvester has added two new power units to its expanding line. The new four-cylinder engines, called the U-175 and the U-281, can be equipped for operation on gasoline, LPG, natural gas, distillate, or kerosene. The U-175 develops 50 hp at 2000 rpm on gasoline, with a compression ratio of 6.8-to-1. Displacement is 175 in. The U-281 produces 67.5 hp at

# NEW, SAFE



# MAYO MINE CAR COUPLER

. . . the coupler with the mating instinct.

Mayo's new, cast steel coupler for narrow gauge mine cars couples instantly on tangent or eurves. Safe, self-centering link completely eliminates all hazards of hand coupling. Only a little more expensive than link-and-pin, it more than pays for itself by preventing accidents. Easily installed by bolting to existing cars. Write for Bulletin No. 21.

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Shields • Air Locks • Locomotives
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No more algebraic formulas or calculations to make. Simply locate the table covering the member you are designing, apply span and load requirements, and then read off directly concrete dimensions and reinforcing steel data. Follows the latest codes and practices. Send check or money order for your copy, today.

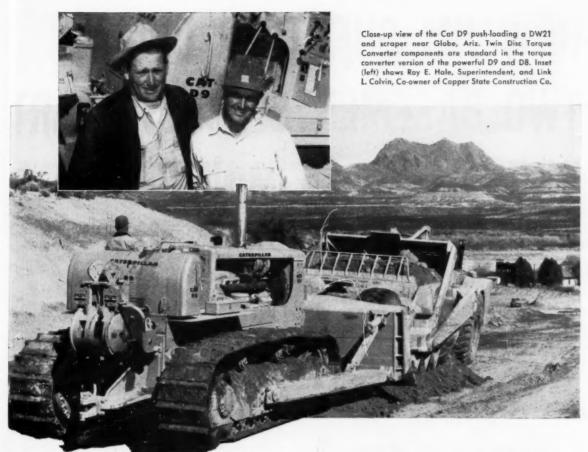
Prepared by The Committee on Engineering Practice

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38 S. Dearborn St., (Div. K) Chicago 3, Illinois



# "Torque converter gives the Cat D9 that extra 'boost' when you need it"

Roy E. Hale, Superintendent, Copper State Construction Co.

When Copper State Construction Co., Mesa, Ariz., took on the contract for building a clover-leaf on U. S. Highway 70 about 20 miles east of Globe, Ariz., it had to move some 70,000 cubic yards of earth—fast and profitably. So one of the powerful Cat D9's (equipped with Twin Disc Torque Converter components) was put on the job, push-loading Cat DW21's and scrapers.

Sizing up the D9's operations, Copper State's Superintendent Roy E. Hale commented: "This D9 is the machine we've been looking for. We like the torque converter drive. It makes the machine operate smoothly and will give it a lot longer life. And when we need that extra 'boost' for tough material, the torque converter gives it to us—with full engine power!"

Little wonder contractors are specifying so many Cat D9 and D8 Tractors with torque converter drive. The torque converter permits the engine to operate at all times in its most efficient speed range... it automatically matches output torque to load demands... and its fluid connection absorbs those jolts and shocks that cause excessive wear and parts breakage.

Contractors everywhere agree that crawler tractors equipped with torque converter drives mean just this: less maintenance, more production—and greater-than-ever profits! Specify a hydraulic torque converter drive in your next D8 or D9 crawler tractor . . . and don't overlook the advantages of Twin Disc Torque Converter drives in other types of industrial equipment or repowering jobs.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois

# HOW JIM GUENTHER DUG TWO BASEMENTS MILES APART IN 7 HOURS, 45 MINUTES

Ann Arbor, Michigan—Two basements in one day with a BAY CITY Model 30—1/2 yard hoe... that's the story told here by Guenther Brothers, excavating and grading contractors. "Differential steering with plenty of turning power", reported Jim Guenther, "makes maneuvering the machine around corners and tight spots a cinch."

#### First Excavation 315 Yards

At 8:00 A.M. Guenther Brothers started the first excavation, moving 315 yards of dirt.

The job was completed in just four hours and fifteen minutes. The BAY CITY hoe was then loaded onto a low-boy. After lunch, the equipment was hauled to the second site, arriving there at 1:15 P.M.

#### Second Basement Dug in Less Time Than First

In just 3 hours and 50 minutes the second excavation was complete, including the entire job of reloading the equipment. Size of the second job: over 300 yards of dirt!



#### **BAY CITY Hoe's Fuel Consumption Low**

In moving the sum total of some 615 yards of dirt (total work time, 7 hours and 45 minutes), Guenther reported that the BAY CITY hoe used approximately 18 gallons of diesel fuel, representing a considerable saving over the 36 gallons used by other machines, on the same type jobs.

With a work-record like this, it is little wonder that Guenther Brothers reputedly have dug and back-filled an estimated 50% of all house basements in the Ann Arbor area during the past ten years.

#### A Few of The BAY CITY Features

Two-shoe swing clutches with cast iron friction wheels for best heat dissipation and resistance to wear ◆ One-piece cast alloy steel bases for greater strength and desirable weight ◆ Long, wide crawlers for added stability
 Ball-bearing drums in tandem actuated by power booster clutches for easiest operation ◆ Helical cut gears for main power give quiet, smooth operation ◆ Self locking worm and worm wheel boom hoist raises or lowers boom under power ◆ Choice of large cubic inch displacement gas or diesel engines provide maximum power ◆ Heavy duty differential permits sharp or gradual turns

#### **BAY CITY Specifications and Catalogs Available**

with power on both crawlers • Available attachments to operate as crane, clamshell, dragline, shovel, hoe.

Model	Rated Capacity	Maximum Bucket Width	Boom Length	Maximum Digging Depth	Maximum Reach	Rated Net H.P.	Catalog
30	1/2	36"	17'0"	17'6"	26'5"	57	30-1
45	3/4	42"	20'0"	22'0"	32'4"	76	45-1
60	1	50"	22'0"	23'3"	34'9"	113	60-B
71	11/2	54"	26'0"	26'8"	39'5"	123	71-A

BAY CITY SHOVELS, INC. . BAY CITY, MICHIGAN



SHOVELS . CRANES . HOES . DRAGLINES . CLAMSHELLS







Page 222 — CONSTRUCTION METHODS and Equipment — February 1957

1800 rpm on gasoline, and its compression ratio is 6.6-to-1. Displacement is 281 in. Maximum torque of the U-175 is 146 lb-ft at 1200 rpm. Maximum torque of the U-175 is 234 lb-ft at 1000 rpm.—Construction Equipment Div., International Harvester Co., Melrose Pa-k, III.



MIDGET VIBRATOR-Stow's new lightweight concrete vibrator, only 1/4 in. in dia., is powered by a 1/2-hp universal motor that delivers 12,000 vibrations per min. Called the Power Midget, the new vibrator is expected to be used on narrow forms such as the fins of prestressed beams, manholes, and various precast jobs. The unit features duplex ball bearings at each end to support the eccentric weight, a 4-ft flexible shaft covered with rubber, and a trigger switch mounted conveniently on the handle. The motor is rated at 6.6 amps at 11,000 rpm.—Stow Mfg. Co., 31 Shear St., Binghampton, N.J.

7-HP ENGINE-A new 7-hp gasoline engine is being added to the Briggs & Stratton line of singlecylinder, four-cycle engines. The new model 19 engine has a 3-in. bore, 25/8-in. stroke, and a piston displacement of 18.56 cu in. It develops its 7 hp at 3600 rpm. The cylinder and crankcase are made of cylinder iron, but the base, cylinder head, bearing supports, piston, and connecting rods are aluminum alloy, which keeps the weight down to 78 lb. The carburetor is a concentric float type, and the governor is an adjustable mechancial type fully enclosed and running in oil. The patented Briggs & Stratton



Assurance of longer service life, with consequently lower replacement costs, recommends "HARDROK" wherever severest drilling conditions call for a truly super-strong air hose.

The carcass is made of horizontally braided steel wires, providing exceptional strength, durability and resistance to kinking, without impairing flexibility. The long-lasting Synplastic tube is impervious to the action of oil from the drill. The cover is a tough, wear-resistant yellow rubber compound. A black spiral stripe gives the hose a distinctive appearance for easy identification. Sizes  $\frac{1}{2}$ " to 2", inclusive

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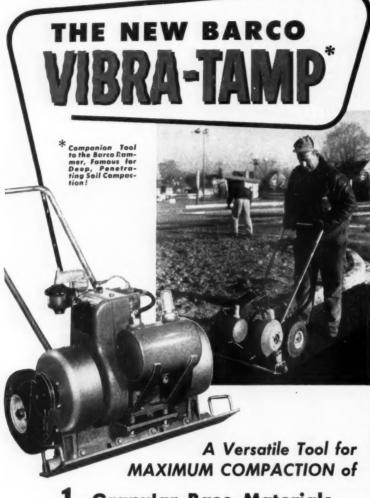
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# Granular Base Materials Bituminous Surfacing

**EFFICIENT**—one man does the work of many with VIBRA-TAMP. Operates in any weather. Works flush against curbs, foundations, and walls.

ECONOMICAL—to buy, operate, and maintain! No special tools required. Saves your bigger, costlier equipment. Tamp up to 750 sq. yds. per hour.

**SAFE**—moving parts fully enclosed. Special vibration dampers reduce operator fatigue. Simple controls. Handle adjustable to comfortable height.

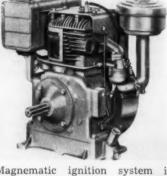
DURABLE – simple design and quality construction keep VIBRA-TAMP on the job day in and day out. Carburetor unaffected by vibration.

VERSATILE—use VIBRA-TAMP for all kinds of work—wherever low cost is a prime consideration. Take VIBRA-TAMP on the big jobs for hard-to-reach areas. Use it for patching streets, driveways, and roads. VIBRA-TAMP has no economy equal—a real work-horse on sand, gravel, soil, chippings!

Ask for new catalog No. 630.

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Magnematic ignition system is used. Available as special equipment is a rotating blower screen to keep foreign material out of the engine cooling systems. Other special equipment includes an electric starter-generator, remote governor and throttle controls, fuel pump, and automatic choke and ignition shielding. — Briggs & Stratton Corp., Milwaukee 1, Wis.



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RECORDS DISTANCE—A new feature designed to aid the machine owner keep accurate job records is now available for all models of Caterpillar crawler tractors. The device is a new type odometer that accurately records the distances traveled in both forward and reverse gears. It is 98% accurate in the lower three gear ranges and 90% accurate in fourth, according to Caterpillar. It is inoperative in fifth gear. The unit can be easily mounted on both spoke-type and disk-type idlers. A rugged casing with a cover plate protects it from damage.-Caterpillar Tractor Co., Peoria, Ill.

MIDGET CRAWLER—Because of its size, the R-9 crawler tractor can work on the top floor of buildings being demolished, dig in basements of existing buildings, and work in many other places that would be inaccessible to larger units. Without attachments, the midget tractor is only 36 in. wide, 62 in. long, and it weighs only 1150 lb. Top drawbar pull is 1300 lb, according



There's a place for BOTH

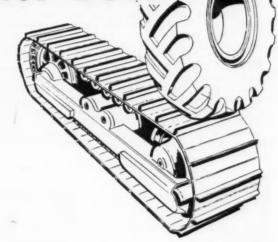
Work problems today demand modern equipment that can do specific jobs faster and at lower cost. Tournatractor is a modern tractor designed to take advantage of ... power, traction, speed and mobility. It does not offer as much drawbar horsepower at speeds below 2 miles per hour as do track-type tractors of equal engine horsepower. But, if your job conditions are such that you can capitalize on speed and mobility—with a machine that delivers comparable traction at present day speeds, we suggest you consider the new LeTourneau-Westinghouse Tournatractor. The cost is 10% below that of track-type tractors with torque converters and comparable engine horsepower.

### Before you buy - EVALUATE

- 1 Your demands for power
- 2 Requirements for traction
- 3 Advantages of speed
- 4 Need for mobility

After giving careful consideration to all of these factors when selecting a tractor, questions in regard to your specific application may still be in your mind. The best way to dispel all doubt about the qualifications of any tractor is to see it perform on your job.

We will be happy to arrange the demonstration of a Tournatractor on your job, to prove that this rubbertired tractor has the *speed* and *mobility* that can pay off for you. Call or write today. No obligation!





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A Subsidiary of Westinghouse Air Brake Company

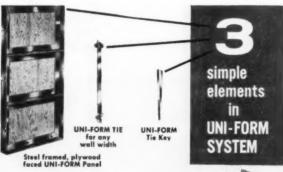
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Whether you're bidding on a sewage treatment plant, industrial building, highway bridges, overpasses or abutments, heavy foundations, circular tanks or a warehouse, UNI-FORM Panels will give you the lowest all around forming costs.

why? UNI-FORM Panels can be erected faster, using less labor and material because the three basic elements of the UNI-FORM System—Panel, Tie and Tie Key provide simple mechanical assembly into any type of form. Unique system of attaching the minimum aligning lumber required reduces labor by 50% . . . preengineered techniques for handling pilasters, corners, stepped footings, columns, battered walls assure fast job progress.



INTERESTED? Get the catalog and complete details on the UNI-FORM System today. Send us a set of plans for our recommendations. You will be money ahead, and there's no obligation.





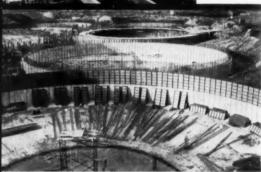
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to the manufacturer. The unit features an in-line transmission with all gear trains and steering units enclosed in one case. The transmission has three speeds forward and one speed in reverse, and these are multiplied by a dual-range feature that includes a neutral position. The transmission allows power turns with one track in high and the other in low range. The clutch is a single disc, dry type that is easily accessible for servicing. The small tractor is powered by a 81/4hp Briggs & Stratton engine. The speed range is 3/4 to 81/4 mph. Prices range from \$1,350 for the basic machine to \$1,795 for the tractor with high-lift bucket .-Mead Specialties Co., Dept SC-36, 4114 N. Knox Ave., Chicago 41, Ill.

HYDRAULIC POWER-The Lectrolift is an extremely compact self-contained hydraulic power unit consisting of a 6 or 12-v dc motor drive, pump, control valve, and tank. The reservoir, which holds 110 cu in. of oil, is a rectangular housing of cast aluminum. The electric motor is flange-mounted to one end of the housing and the pump control valve is on the opposite end. All working parts are totally enclosed and permanently lubricated. It has three operating positions-raise, lower, and springreturn to hold. Lowering control is through a throttling valve that varies the rate of return. It can be mounted vertically, with motor end up, or horizontally. A onelever control can accommodate a clevis for remote control linkage. -Wisconsin Hydraulics, Inc., 3165 N. 30th St., Milwaukee 16, Wis.

M-M ATTACHMENTS—The Ottawa Big Muscle backhoe and frontend loader have been approved by the Minneapolis-Moline Co. for mounting on its new 445 industrial tractor (CM&E, Jan.). The backhoe, which is available in two models, can be equipped with buckets from 12 to 36-in. wide. One model



#### SCHRAMM ASKS COMPRESSORS USERS:

# Why use more fuel and get less air power?

Schramm Pneumapower Model 125 piston type compressor uses 15% less fuel than other highly publicized air compressors. Yet it delivers 15% more power—produces 125 cfm of compressed air to operate more pneumatic tools, or the same tools at higher efficiency.

Reason is that compressed air at higher temperatures can do more work. And Pneumapower's built-in temperature control holds air constantly at maximum 275°F. For water-cooled, piston type, Schramm Air Compressors can operate safely at temperatures that would cause serious trouble in oil-cooled compressors. Consequently, Schramm Pneumapower Compressors produce far more power.

Schramm Pneumapower is the handiest, most economical air compressor you've ever seen. It's the shortest, narrowest, lowest 125 cfm gasoline engine-driven unit made—and costs the least to buy and maintain.

We'll be glad to send you full details of Schramm Pneumapower Compressors. Write for, "Let's Design a Perfect Air Compressor." No obligation, of course.

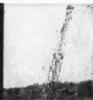


Wheel mounted or skidded, Pneumapower is compact, light in weight, easy to handle. Unlike power take-off assemblies, Pneumapower can be placed in any position on truck; it has no belts, gears or other transmission.



Schramm Pneumapower furnishes full rated air at tool—enough to operate a three gang tamper and another tamper.





### TO STEADY JOB PROGRESS and PROFIT!

Wherever hose is used... for steam, air and water... you can insure against costly job delays due to leaks, blow-offs and pressure losses by relying on these quality fittings...leaders in the DIXON Line especially designed for construction and roadbuilding service.





Also available in Washer Type, Style W-16. Companion Male, Style MX-16.

# "GJ-BOSS" STYLE X-34 GROUND JOINT FEMALE COUPLING

The strongest, safest coupling made for pile driving, jetting, grouting, caisson, manifold and high pressure water and hydraulic hose connections. Leakproof, ground-joint construction eliminates replacement of lost or worn-out washers. Sizes  $\frac{1}{4}$ " to 6".



### "GJ-BOSS" GROUND JOINT AIR HAMMER COUPLING

The unmatchable coupling for all heavyduty air hose connections to hand drills, wagon drills, drifters, jumbos. Quickly connected and disconnected, with no lost or worn-out washers to replace. Compact and Heavy Types.



Also available in Washer Type. For lighter service: "GJ-DIXON" & "DIXON"



Made in regular and heavy patterns, sizes 1" to 8"

### "KING" SHANK COUPLING

For all sizes of suction and water hose. Strong and durable, yet comparatively light in weight for easy handling. Absolutely uniform in quality, threading and dimensions, with deeply formed corrugations. Pin lugs on swivel.





# "BOSS" SELF-HONING AIR VALVES

The right valve for the efficient control of air on compressors, manifolds, headers, sump pumps, etc. Strong, durable, compact. Self-adjusting, quick-opening, full flow. Bronze plug automatically hones to perfect seal against harder metal of valve body.



"KING" COMBINATION NIPPLE • "AIR KING" QUICK-ACTING COUPLING
"KING" SINGLE and DOUBLE BOLT HOSE CLAMPS

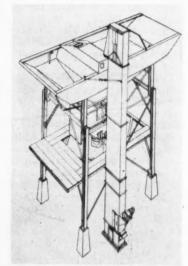
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# DIXON Valve & Coupling Co.

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA. BRANCHES—CHICAGO BIRMINGHAM - LOS ANGELES - HOUSTON - DIXON VALVE & COUPLING CO., LTD., TORONTO EQUIPMENT NEWS . . . continued



digs 11-ft deep, and the other digs 8½-ft deep. An automatic ejector bucket and a clamshell bucket with twin-double-acting cylinders are available for the backhoe frame. Ottawa's patented One-Trol (single operating lever) controls all actions of the front-end loader, and dual One-Trols operate the backhoe. Double acting, pistontype cylinders with chrome plated rams are used on both the loader and the backhoe.—Ottawa Steel Div., L.A. Young Spring & Wire Corp., Ottawa, Kan.



TRANSIT-MIX CHARGER-As a basic transit-mix batch plant, the Johnson Econoplant consists of three aggregate bins with a total heaped capacity of 45 yd, and a 70bbl cement compartment with a 180-bbl-per-hr capacity elevator to handle bag or bulk cement. Features of the plant include all-welded bins, simplicity of erection, and a manually-operated concentric batcher that weighs cement on a separate scale and then discharges it within the aggregate to assure good pre-mixing. The bins are designed with large top openings so that they can be charged easily



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# PRECAST STRUCTURAL CONCRETE and LEHIGH EARLY STRENGTH CEMENT

These two buildings provide a good example of the adaptability—and rapidly increasing use—of precast concrete for all types of structures. Built for the B. F. Huntley Furniture Co., Winston-Salem, N. C. they have 246,000 square feet of floor and roof area, framed entirely with precast concrete columns, beams and joists.

In the precasting of these members, Lehigh Early Strength Cement was used to achieve maximum production efficiency and economy.

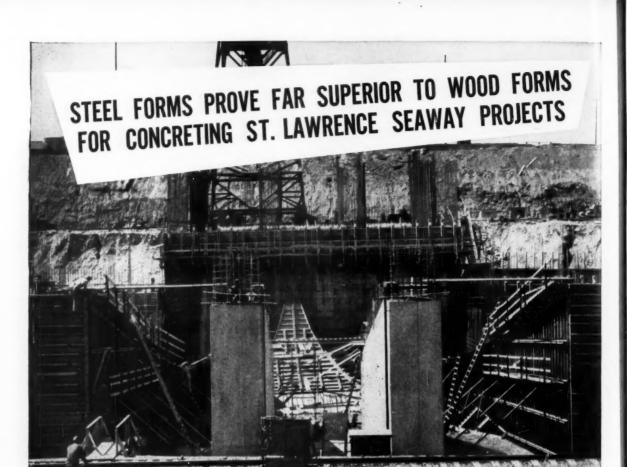
"Structural members which were cast one day were stripped from their forms the following day and moved to storage," writes Mr. W. D. Shea of the Arnold Stone Company. "By using Lehigh Early Strength Cement, the precasting operation was completed in 50% of the time which would have been required had we used regular portland cement."

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction.

- · LEHIGH EARLY STRENGTH CEMENT
- · LEHIGH MORTAR CEMENT
- · LEHIGH PORTLAND CEMENT
- · LEHIGH AIR-ENTRAINING CEMENT



LEHIGH PORTLAND CEMENT CO. Allentown, Pa.



# BLAW-KNOX time and labor-saving STEEL FORMS surpass 12-month wood forms yardage in one summer season!

TWO concreting methods used on the St. Lawrence Seaway Project's Barnhart Island Power Dam showed significant differences between the use of steel forms and wood forms. Working a 12-month season on half of the dam, the contractor using wood forms was well ahead of the contractor responsible for the other half in yardage placed by the spring of '56. Last May, starting a "summer-season" schedule, B. Perini & Sons, Inc. utilized the speed and laborsaving advantages of Blaw-Knox Steel Forms to catch up with and surpass the wood forms users in concrete poured before the onset of cold weather last fall.

Here are a few of the reasons why Blaw-Knox Steel Forms have proved to be far superior on the Barnhart Island Power Dam:

• Steel forms mean speed! Perini could get one complete use of each set of steel forms every 3 weeks, as compared to a possible 7-week cycle on the wood forms.

- Piers, walls, roofs and the rear elbows of draft tubes can be formed and poured in low lifts. Forms can be moved quickly along from unit to unit of the dam, in a fast cycle of re-use.
- Designed specifically by experienced Blaw-Knox engineers for the exact configurations and construction joints of this structure, the steel forms saved the time and labor of building wood forms to fit each pouring phase.

Blaw-Knox Steel Forms engineers are backed by over 40 years' practical experience in solving concreting problems on dozens of big projects such as Chief Joseph Dam and The Dalles project, as well as many of the other lock and dam structures of the St. Lawrence Seaway. You can put that experience to work for you. Whether your job is a big dam, tunnel, bridge, or small sewer, be sure to call in the Blaw-Knox Steel Forms Consultation Service in the preliminary planning stage for the simplified, fast forming that increases your profits by reducing time and labor costs.

### BLAW-KNOX COMPANY

STEEL FORMS DEPARTMENT • BLAW-KNOX EQUIPMENT DIVISION
P. O. BOX 1198 • PITTSBURGH, PA. • PHONE STERLING 1-2700



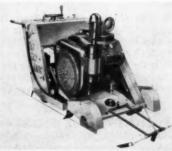
BLAW-KNOX STEEL FORMS CONSULTATION SERVICE

### EQUIPMENT NEWS... continued

with a clamshell. A completely integrated line of aggregate handling and handling attachments and storage facilities, including aggregate conveyors, belt conveyors, cement storage silos, and screw conveyors, are available as optional equipment.—C. S. Johnson Co., Champaign, Ill.



TIRE SEALER-Rubbertex is a tire sealant special asbestos base that cannot freeze, gum up, or change characteristics under temperature extremes. The liquid sealant is non-inflammable and it will not chemically affect the tire or fire valves. It is injected directly through the tire valve into the tire with a special gun without removing the tire from the wheel. When a nail or other sharp object penetrates a tire, Rubbertex prevents any immediate loss of air pressure by forming around the object. After the sharp object is removed, the liquid seals the hole.—United Rubbertex Corp., 260 Madison Ave., New York, N.Y.



36-HP SAW—Automatic retractable turning wheels are incorporated in Clipper's new self-propelled 36-hp concrete saw. According to the manufacturer, the Retract-A-Turn feature cuts line-up time drastically because there is no lifting, or tilting when moving the saw into position. Dual caster

# Kegoing ON THE MOVE"

with the WEST System and Equipment CUTS HANDLING COSTS!...









The WEST SYSTEM of masonry materials handling-first and only complete, integrated and blue-printed system of moving specified quantities of palletized material and mortar . . . from delivery truck, around the job site, onto the scaffold and right to the brickmason's elbow. Tested and proven nationally on job after jobfrom housing projects and light commercial to schools, hospitals and industrial buildings—the WEST SYSTEM increases safety, reduces human effort, minimizes breakage and opens the door to substantial savings . . . up to 75% in materials handling . . . up to 15% in overall masonry costs.

For complete details-call or write



# White HEATING KETTLES

# FOR SAFER MELTING OF BITUMINOUS MATERIALS



**Tool Heaters** Surface Heaters Special F-10 Compound Kettle **Torches and Burners** 



Capacities from 80 to 325 gallons. All equipped with exclusive FIRE PROOF TOP (hinged tops available for roofing use). Operator and equipment are protected from flash fires. Complete line of accessories optional, Choice of kerosene and propane burners.

White MANUFACTURING COMPANY

ELKHART 6. INDIANA

Correctly engineered to bear heavier loads, lengthen ropelife, reduce maintenance costs



 Because they're designed and engineered for specific tasks, you'll find MADESCO blocks with heavy steelshells and fittings your safest choice. In materials, in construction too, Madesco tackle blocks assure you the extra service that comes from over thirty years of specialized experience and "know-how." Buy Madesco blocks and "know-how." Buy Madesco blocks and you make substantial savings on your rope costs, because Madesco sheaves (of iron or steel graphite bronze) are correctly-grooved to prolong rope-life. Loads travel smoothly, easily, quickly to save lifting time; that means savings too that come from minimized maintoo that come from minimized maintenance and down-time. There's a com-tenance and down-time. There's a com-lete line of Madesco tackle blocks for every need. Consult your industrial dis-tributor—and meantime write for our catalog

WORTH ASKING FOR-BY NAME MADESCO TACKLE BLOCK CO., Easton, Pa. **EQUIPMENT NEWS...continued** 

wheels automatically take over the load when the blade is raised out of the cut and when the blade is lowered into the cut the caster wheels are automatically raised. When cutting is actually taking place, the saw rides on four rubbertired wheels that cut down drift to either side. Called the C-360, the new saw gives self-propelled speeds of up to 26 fpm. All engine and saw controls are convenient dash-mounted in one small grouping. Clippers positive screw feed raises and lowers the blade at the touch of fingertip control. No extra rulers for measuring the depth of cut are needed .- Clipper Mfg. Co., 2800 Warwick, Suite 143, Kansas City, Mo.



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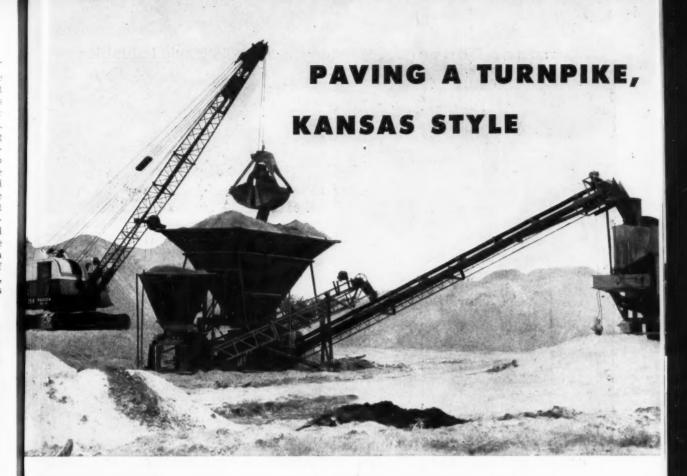
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GANTRY ON WHEELS-The new wheel-mounted Magic-Pole gantries feature easily variable height wheel tread adjustment. The model illustrated has over 6 ft of adjustment in each leg so that it can be used on ramps, platforms, or truck beds. All four legs and their braces can be folded against the lightweight aluminum I-beam for easy storage. A trolley travels the entire length of the I-beam. Magic-Pole gantries are available in heights up to 17 ft, with 17-ft spans, and in capacities up to 2 tons .- B. E. Wallace Products Co., Exton 5, Pa.

FEATURES LARGE ROLLS-Cedarapids' 55x30" roller bearing crusher features large diameter rolls that give it capacities ranging up to 520 tph, depending upon the size of the finished product and the characteristics of the material. Maximum finished size is 5 in., and the minimum size is 1/4 in. The crusher, called the model 5530, can be equipped with two smooth roll shells, two corrugated rolls, or one



# lamshell, Hopper, Conveyor and Portable Plant Keep Blacktop on the Move

his Marion 43-M, equipped for clamshell evice, is playing its part in the construction if the Kansas Turnpike by keeping a couple if hoppers filled.

he picture tells its own story of how aterials flow into the portable asphalt ant at the extreme right.

his is one of three Marions for this owner, and is his second Marion 43-M. The 43-M is a big one-yard machine with many features that make it a favorite of contractors. For tample, it converts easily and quickly on the big; its air control gets more work done with the sphysical effort and less maintenance are. Its self-cleaning crawlers travel and tork in almost any footing.

sk your Marion Distributor for the names 143-M owners in your area—talk with tem about their machines. And get detailed aformation on the rest of Marion's broad line 1 machines for every contractor requirement.

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency

SHOVEL HOE			ASK			
MACHINE	CAP. CAP. IN IN CU. YDS. CU. YD		CRAWLER MOUNT MAX.* MAX. STABILITY USABLE		MOUNT MAX. USABLE	BULLETIN NO.
MARION 35-M	3/4	3/4	18T @ 10'	18T @ 10'	25T @ 10'	431
MARION 43-M	1	1-11/4	271 @ 10'	20T @ 12'	35T @ 15'	430
MARION 362	.11/2	11/2-2	43T @ 12'	30T @ 15'		398-D
MARION 87-M	Specia	Crane	150T @ 12'	751 @ 15'		
MARION 93-M	21/2		80T @ 12'	50T @ 15'		397-F
MARION 101-M	3		84T @ 12'	57T @ 15'		417-A
MARION 111-M	4		169T @ 12'	105T @ 15'		402-C

\*For Comparison Purposes Only

# MARION POWER SHOVEL CO.

MARION, OHIO, U.S.A.

Please send me Bulletin 430 on the Marion 43-M.

Name Title

Address

City State .....

### Gardner-Denver... Serving the World's Basic Industries



Self-propelled "Air Trac" drill for rough terrain.



Hydraulic booms and remote-controlled drills for mounting on tractor truck or half-track.

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New 51/2" heavy-duty rock drill on self-propelled crawler.



All-weather rotaries in 600-foot and 900-foot capacities.



Long-feed tunnel drills and hydraulic booms.

# Cost-saving tools for the big push

When you come to  ${\rm rock}\dots{\rm come}$  to Gardner-Denver for cost-cutting rock drill equipment. Ask for bulletins.

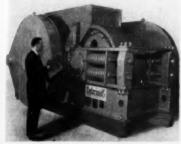


# GARDNER - DENVER

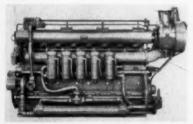
THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

There's a Gardner-Denver distributor in your area—
see him for details



of each, depending on job conditions. Safety shear plates protect the crusher against tramp iron or uncrushable material, and the opening between the rolls can be easily adjusted by inserting or removing shims in a slot on top of the frame. Big shafts with Timken tapered roller bearings provide long wear and economical operation.—Iowa Mfg. Co., Cedar Rapids, Iowa.



USE CHEAP FUEL—An improved series of industrial diesel engines that can operate exclusively on low-cost fuel without undue maintenance is being developed by the White Diesel Engine Div. of White Motor Truck Co. Called the series 40 Superior diesel engines, the new units are available naturally aspirated or supercharged in ratings up to 1,025-hp in four-cycle, six or eight-cylinder models. Design features include improved open chamber combustion that gives better fuel economy; dual fuel operation on 100% oil; heavy-duty starting systems; simplified cylinder block design that facilitates maintenance; and individual cylinder heads that are removable and interchangeable. The new models offer power increases of up to 50% over previous models, yet their size has not increased appreciably.-White Motor Co., Springfield, O.

BIGGER JAY—Operating on the same principle as the popular Jay 12, the new model Jay 24 is particularly designed for larger areas where maneuverability of the larger machine can be used to advan-



# CARCO WINCHES HANDLED TOUGHEST JOBS ON LARGE PIPELINE PROJECT

Three nationally known pipeline contractors shared in the difficult job of building the Pacific Northwest pipeline through the mountainous terrain between Umatilla, Oregon, and Chehalis, Washington.

All three of these contractors used Carco winches for towing, holding and lowering heavy equipment up and down grades that

averaged around 50% to 55%.

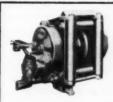
The Engineers Limited Pipeline Company of San Francisco, for example, used five International TD-24 tractors equipped with Carco Model J winches.

These husky, dependable Carco winches were continually called upon to perform tasks that only properly engineered and ruggedly built equipment could stand as a day after day diet.

It's no small assignment to skid huge boulders out of the right of way, to tow, hold and lower heavy equipment like trenchers and backhoes up and down steep grades, to do the same for two tractors carrying joints of 26" pipe or large sideboom tractors, to tow and lower welders, coating pots and other jobs of like nature. Yet Carco winches did all these, took them in stride and asked for more.

Similar experiences are responsible for the fact that practical pipeliners everywhere know that Carco winches are thoroughly and completely dependable—in truth, are one of the most reliable pieces of contractor's equipment on the market.

See your nearest Carco dealer. He will help you select the model that best fits your needs. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.



Four roller fairlead, available at added cost for Model J, maintains maximum line pull while winching loads from any direction.



The Model J constant mesh 4-stage gear train, by high ratio of gear reduction, converts tractor power into line pull directly and efficiently.

Carco winches are nationally known for their efficient performance and dependability. That's why Carco makes more winches for more makes and models of industrial tractors than any other producer.





# ACRES OF DAYLIGHT

# for the night shift with ONAN power

For night lighting on big projects an electric plant should combine high capacity with mobility ... high capacity to handle a bank of powerful floodlights ... and mobility to simplify frequent moving on the job site.

The Onan 10CW electric plant meets both requirements. It delivers 10,000 watts A.C., yet it weighs only 800 pounds. It is completely Onanbuilt, with a heavy-duty Onan 2-cylinder, gasoline engine direct-connected to an Onan all-climate generator in a permanently-aligned, compact, longife unit. Starts instantly in any weather. Air-cooling eliminates trouble from freezing or leaking coolants. Available also as a 7.500-watt unit

Available also as a 7,500-watt unit. Put these mobile, high-capacity units to work on your next lighting job.



Onan 3KW Series 3DSP Diesel electric plant mounted



Onan 10CW mounted on a portable, skid-mounted floodlight tower. This unit is being used for night operations on a St. Lawrence Seaway project.



Trailer-mounted 10CW. Tow it anywhere behind car or truck, Weatherproof housing.

#### 500 to 75,000 watts

Lightweight, portable, gasoline-powered plants: 500 to 10,000 watts. Water-cooled plants: 10,000 to 75,000 watts. Air-cooled Diesel Plants: 3,000 and 5,000 watts.

See your Onan distributor or write for specifications



# D. W. ONAN & SONS INC.

2867 University Ave. S.E., Minneapolis 14, Minnesota

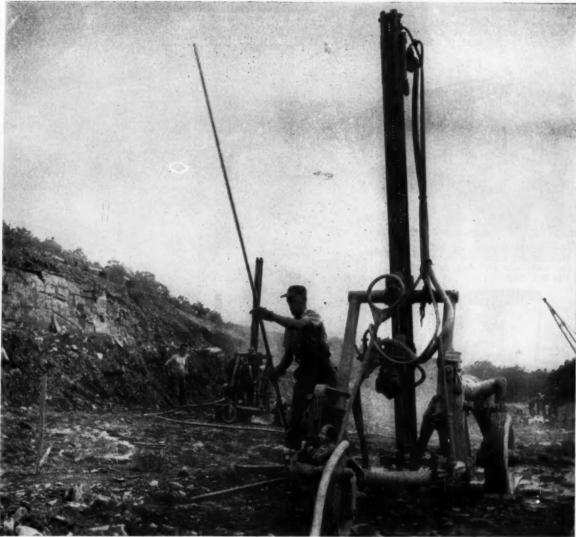


tage. Blade sizes range from 24 to 36 in., and they can be easily changed to meet job conditions. Using an air-cooled 7-hp Wisconsin engine, the tamper provides 2500 3600-lb impact blows per min.—Jay Co., 168 Hosack St., Columbus, Ohio.



#### MANEUVERABLE LIFT TRUCK

-Hyster's new pneumatic-tired lift truck combines a compact frame with the largest possible wheelbase. The combination results in exceptional maneuverability characteristics without sacrificing stability. The 1061/2-in. long truck can turn in only 100 in. The 7000-lb capacity unit is powered by a 70-hp Hercules gasoline engine that develops 182-ft-rb of torque at 1200 rpm. Hydraulic booster-type power steering is standard, as are floating drive axles that offer a 4-to-1 final reduction at the drive wheels to reduce strain on transmission components. The Hyster 70 also features center point steering with a rugged steering axle that pivots about the longitudinal axis of the truck to maintain tire contact over rough ground. The truck can be equipped with a number of special attachments, including crane boom.-Hyster Co., 2902 N. E. Clackamas St., Portland 8. Ore.



Bethlehem Hollow Drill Steel performs economically at dam and reservoir for Bethlehem (Pa.) Water Authority. General Contractor: Lycoming Construction Company, Inc. Engineers: Morris Knowles, Inc. Drill Steel Reconditioner: Howells Mining Drill Co.

# Moving 108,000 cu yd for Penn Forest Dam

Taking out about 108,000 cu yd of medium-hard shale and sandstone, with Bethlehem Hollow Drill Steel, was one of the initial phases of construction of the Penn Forest Dam and Reservoir, an auxiliary water basin for the City of Bethlehem, Pa. The 6,000,000,000-gal reservoir, now under way in the Pocono Mountains, is scheduled for completion in 1958.

The Bethlehem Hollow Drill, 1-in. hexagon and 1¼-in. round, was used in wagon drills and jackhammers. It was fitted with multi-use and carbide-insert bits. Maximum depth of blast holes was 12 ft.

Bethlehem Hollow Drill Steel is economical for any type of rock drilling because it's rolled from tough fatigueresisting steel. Its wide quenching range makes it easy to heat-treat for the proper balance of toughness and wearresistance. Besides, it provides long-wearing threads and strong shanks.

Bethlehen: Hollow Drill Steel is stocked in carbon and ultra-alloy grades in rounds, hexagons and quarter-octagons. It is furnished regularly in lengths of from 18 ft to 27 ft. Longer lengths can be furnished for holes of special depth. For an economical job, team up with Bethlehem Hollow on your next rock-drilling job.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM HOLLOW DRILL STEEL CARBON AND ULTRA-ALLOY

Model GA — for medium-heavy-duty work. 2, 3, or 5 hp motor, 12'' or 14'' saw blade cuts  $4^1/2''$  deep, 24'' x 1'' wide, rips  $34^3/4''$  wide.



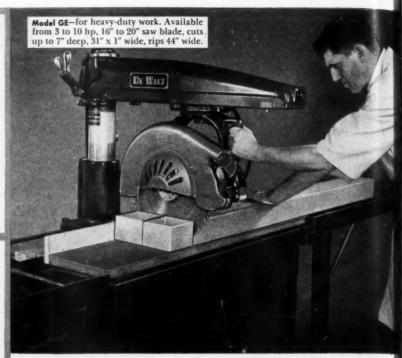
Model R2 — for medium-duty work — with retractable arm. 2, 3, or 5 hp motor, 12" or 14" saw blade, cuts 4½" deep, 20" x 1" wide, rips 36½" wide.



Model GW — for builders, schools and small shops, with handles for portable use. 1½ hp motor, 10" saw blade, cuts 3" deep, 16" x 1" wide, rips 26" wide.



Alse a 9" Model MB Home Pewer Shop, plus a complete line of De Walt accessories, including magnetic brake for all models, safety power rip feed, power cross feed, Spir'Ator Safety Return, as well as a variety of interchangeable saw parts to meet unusual resultrements.



Contractors everywhere depend on

# **AMF DeWalt Power Saws**

for all their cutting jobs

Cuts capital equipment costs 60% or more! One AMF De Walt® power saw does the work of many single-purpose machines... quickly converts to any of 12 basic power tools. It does all regular woodcutting, mass-production cutting, and keeps special jobs in the shop. A De Walt ends the need for money-wasting equipment that often stands idle... saves 75% in floor space alone, since it can be set and used against a wall!

Cuts work-time costs! AMF De Walt saves up to 90% in layout and marking time... gives safer, easier, faster top-side cutting... material always moves in a straight line on a level table for maximum safety and modern production efficiency. Operators everywhere like its safer, easier handling.

Cuts finished product costs! Users by the hundreds of thousands have proved AMF De Walt produces finer work, faster...at far less over-all cost than the equipment it replaces.

And there's an AMF De Walt for every cutting need—for construction, maintenance and repair, shipping departments, pattern shops, production lines, lumber yards, planing mills—wherever wood, metals, plastics and compositions are cut.

Compare an AFM De Walt and its money-saving advantages with your present equipment. And you'll buy De Walt for your next job. See your dealer for a demonstration, or write department CM-702 for Free Illustrated Booklet, JOB-TESTED METHODS FOR CUTTING COSTS.



DeWALT Inc.

Lancaster, Pa.

Subsidiary of AMERICAN MACHINE & FOUNDRY COMPANY



# New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

SPECS AND PICS — Brunner & Lay products—carbide rock-bits, drill steels, and pneumatic tool accessories—are featured in a new 20-p catalog. Pictures and complete specifications are given for each product, along with suggestions for obtaining the best drilling results. Accessories include moil points, sabur points, clay spades, and asphalt cutters. — Brunner & Lay, Inc. 9300 King St., Franklin Park, Ill.

PATENT SCAFFOLD LINE — Scaffolds and ladders for construction, concrete shoring, and repair jobs are described and illustrated in a new 32-p catalog published by Patent Scaffolding Co. Erection procedure, technical data, uses, and typical installations are supplied for each of the many types of built-up, suspended, and swinging scaffolds. Wood, aluminum, and magnesium ladders, and aluminum scaffolds are described. — Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N.Y.

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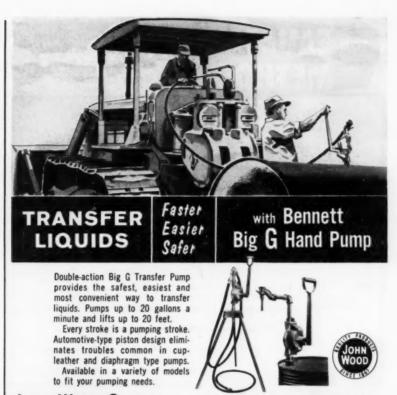
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WEAR THEM RIGHT- A new 12p cartoon booklet called "Attempted Murder" explains the importance of safety head protection, and the correct way to wear hard hats. A recent survey demonstrated that almost 45% of the men now wearing hard hats were wearing them incorrectly. The booklet is available to safety engineers who want to distribute them to men who wear hard hats. The booklet recommends that hard hats be worn with a clearance of not less than 11/2-in, between the crown of the hat and the top of the head. It points out that the greater the crown clearance, the more the hat can absorb shocks. The booklet contains case histories to back up its claim .- E. D. Bullard Co., 2680 Bridgeway Blvd., Sausalito, Calif.

HYSTER BULLETINS—"How to Operate a Lift Truck" is an informative 24-p booklet that uses the carton technique to spread data on the operation, preventative maintenance, safety, and basic materials handling techniques of fork



JOHN WOOD COMPANY · Bennett Pump Division · Muskegon, Michigan IN CANADA: JOHN WOOD COMPANY LIMITED Toronto · Montreal · Winnipeg · Vancouver

Wagner Sangamo

# Tachographs

provide constant supervision that can



Tachographs provide constant supervision, encourage safer driving habits...resulting in fewer reportable accidents and lower insurance rates.

Tachographs are recording speedometers ... mount easily inside cab... automatically record, on wax-coated charts, the complete operation story: when started—stopped—idling time—speed—distance traveled—number of stops. Illuminated dials show time of day, M.P.H. or R.P.M.,

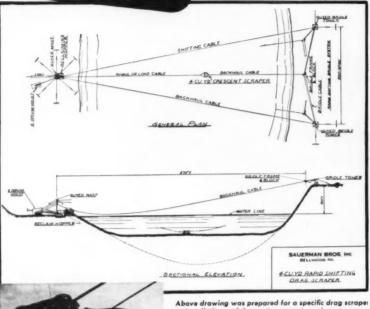
and total mileage. Red light warns driver when your predetermined speed is exceeded.

Tachographs are a sound investment in more efficient performance and maximum service from your fleet. These precision instruments earn added savings for you through reduced maintenance costs and elimination of lost time. Coupon below brings your copy of Bulletin SU-3 that describes the many advantages Tachographs offer you.

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# the SAUERMAN

### **Scraper Machines Engineered** to **Your Operation**



installation and does not represent maximum spans.

The Sauerman Method works equally well over widely differing areas and span limits . . . on hills, swampy ground or underwater . . . handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower-basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads-not dead weight. When expendable parts-sheaves, clutch or brake linings-are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job-a system that will give you the lowest cost per cu. yd. handled.



View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

Centact Saverman's engineering depart ment for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers-24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

# BROS. INC.

612 S. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers . Slackline and Tautline Cableways . Durolite Blocks

#### **NEW PUBLICATIONS...**

continued

lift trucks. Prepared for use as part of an operator training program, this booklet is slanted for both the beginner and experienced operator. It can be studied individually, or used as a guide by instructors. The advantages of torque converter drive for lift trucks are described in a new specification sheet on the Hystamatic Drive. The torque converter transmission permits exact "inching" control, and does away with constant shifting requirements. It is available as optional equipment on Hyster units of 3,000. 4,000, and 5,000-lb capacities. -Hyster Co., 2902 N. E. Clackamus St., Portland, Ore.

APPRENTICE TRAINING - A new illustrated booklet describing the national apprenticeship program has been released by the U.S. Dept. of Labor. Called "Apprentice Training-An Investment in Manpower," the 32-p booklet explains in non-technical terms the aims, organizations, and operation of the national apprenticeship program. It is designed to answer inquiries received from employers, trade unions, and young persons interested in learning a trade-Publications Branch, Bureau of Apprenticeship, U.S. Dept. of Labor, Washington 25, D.C.

CONSTRUCTION SIGNS - The Grote Mfg. Co., Inc., recently announced a new catalog covering signs and marking for road construction and maintenance jobs. Included are directional symbols, advance and approach warnings, guide signs, barricade strips, and delineator strips, as well as other signs.—Grote Mfg. Co., Inc., Bellevue, Ky.

NEW BANTAM-A 4-p illustrated bulletin described the latest Bantam, the crawler-mounted C-35. It contains detailed information, latest specifications, features, capacities, and application data for the 3/8-yd-5-ton capacity crane-excavator. Operating ranges and capacities are shown on large, easy-toread charts that cover crane, shovel, and backhoe attachments.-Schield Bantam Co., Waverly, Iowa.

KENWORTH LINE - The Kenworth 18, 24, 36, and 48-ton capacity custom-built end dump trucks are described in a new bulletin

\$8,269.02 (Hartford File #HM53-2037)



**\$850.67** (Hartford File #61474)



**\$4,000.00** (Hartford File #18217)

# Many contractors are protected against equipment losses like these ...

are you?

No matter how well your men know their jobs ... no matter how rugged your machines are ... your major financial investment in equipment demands adequate insurance against loss.

That's why you need the protection offered by a Hartford Contractors' Equipment policy. This insurance is available for all of your equipment. It protects it against loss by fire, theft, explosion, landslide, overturn, collision, windstorm and other specific hazards. Covers them on the job ... in transit ... in storage.

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Make sure you'll have this satisfying protection and service when you need it. The first step? Write for more information . . . and a copy of our useful booklet, Your Machinery and its Actual Cash Value. Better yet, call your Hartford Group Fire Insurance Agent or your insurance broker!

Year in and year out you'll do well with the



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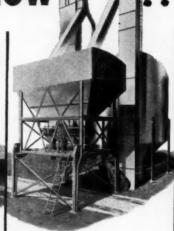
HARTFORD Fire Insurance Company Group Hartford 15, Conn.

Please send me more information about the advantages of a Hartford Contractors' Equipment Policy. Also include a free copy of Your Equipment and its Actual

Firm Street\_ \_Zone\_\_\_ It captured all eyes and "ayes' at the road show









COARSE STONE

FINE STONE

CEMENT

SAND

### New One-Man Operated BUTLER TX-4 BATCHING SYSTEM that **Keeps Pace with FOUR 34-E Pavers!**

#### PUSH BUTTON CONTROLLED



Pre-set batchers can be operated by single batcher man at cement platform, or by truck driver at each bin.

MAXIMUM PORTABILITY





Bins are completely pre-assembled for easy crane handling, with hinged columns. Batcher units handled with all piping and wiring in place.

#### A new Concept in ULTRA HIGH SPEED BATCHING

If you were at the Show you saw it. Everyone did! New Butler engineered AUTOMATION so advanced, so flexible, so fast, so dependable that it obsoletes all existing roadbuilders' plants. It's the new BUTLER TX-4 Batching System, the modern batching plant that every contractor today needs to compete successfully. The contractor with only one paver starts with a TX-4 plant equipped with 2 batchers; then, as he expands with the road program, he simply adds additional batchers to the same bins to take care of 2, 3, or 4 pavers - and still retaining ONE-MAN OPER-ATION.

# LER BIN CO. 949 Blackstone Ave., Waukesha, Wisconsin

PIONEERS IN AUTOMATION FOR ROAD BUILDERS, READY MIX, CONCRETE PRODUCTS

BASIC UNIT — Handles 1 or 2-batch trucks.







EXPANDED UNIT - Batchers added to handle 4batch trucks, 4 pavers operating at maximum capacity.











Page 242 — CONSTRUCTION METHODS and Equipment — February 1957

# NEW PUBLICATIONS . . .

which details their features and pertinent specifications. Front axles, front and rear brakes, body construction, spring mountings, and steering systems are discussed and illustrated.—Kenworth Motor Truck Co., Pacific Car and Foundry Co., 8801 E. Marginal Way, Seattle 8, Wash.

CONTRACTORS' LUBRICANTS—Keystone Lubricating Co. has released a new bulletin entitled "Keystone Specialized Lubricants for Contractor Equipment." If deals with lubricants used for earthmoving, strip mining, quarrying, excavating, dredging, and other types of heavy equipment. Altogether, the 6-p bulletin describes the application of grease and oil to 24 types of heavy equipment.—Keystone Lubricating Co., Philadelphia. Pa.

ENGINE VARIETY—Detroit Diesel industrial power units and fanto-flywheel engines for use in hundreds of standard and special applications are described and illustrated in a new brochure. Covered are horsepower ratings, dimensions, and accessory information on single and multiple-engine power plants ranging from 56 to 761 brake hp.—Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

A-C BULLETINS — Three new pieces of literature are available from the Construction Equipment Div. of Allis-Chalmers. Two of the bulletins cover specifications and design details of the HD-11G and the HD-6G crawler tractor-shovels, including their matched attachments. The third bulletin, called MS-1149, covers the four pull-type scrapers in the Allis-Chalmers line. — Allis-Chalmers Mfg. Co., Milwaukee, Wis.

PICK A PUMP—A handy reference chart that enables contractors to quickly spot the type of pump best suited for a particular job application is one of the features of a new catalog issued by Barnes Mfg. Co. The chart covers such jobs as dewatering, sprinkling, equipment cleaning, tunneling and dam applications, and gravel washing. The catalog illustrates and lists specs for engine driven, electric and universal driven self-primers.—Barnes Mfg. Co., Mansfield, Ohio.



Contractors know a nut and bolt assembly is only as strong as its washers. That's why in high strength structural steel bolting, quality-conscious consulting engineers and contractors demand washers that match the best nut-and-bolt assemblies in . . .

- 1. High tensile strength
- 2. Holding power
- 3. Uniformity

On all three counts, Mil-Carb Carburized Washers fill the bill best—developed specifically by the world's largest producer of washers to meet the needs of modern structural steel jointing.

Mil-Carb Washers are fabricated from prime carburizing quality special soundness steel to insure strength to equal or exceed the rigid specifications of ASTM designation A-325.

Maximum holding power is assured by a closely supervised carburizing process which retains inner ductility of the met-

al, yet provides an exceptionally hard "outer skin". It's this tough "outer skin" which permits torquing nuts to specification maximums without danger of "galling" or grinding of the washer . . . imperative for permanent, uniformly strong, tight joints!

In addition, Mil-Carb Washers are uniformly flat and smooth with dimensions conforming to current requirements for heavy plain washers (carburized) of the American Standards Association (ASA Designation: B27.2).

For permanently strong, tight joints that become integral parts of the steel structure... as permanent as the steel itself... specify Mil-Carb Carburized Washers. Available in six sizes, from %" to 1 %", packed in 200-lb. kegs.

Distributed by Leading Bolt and Nut Manufacturers and

U. S. STEEL SUPPLY DIVISION
UNITED STATES STEEL CORPORATION
208 South La Salle St. \* Chicago 4, Illinois





has slowed down the construction boom. This year's forecast increase is less than half the 16% rate of rise in 1956, which in turn was about half the 30% increase in 1955. Moreover, awards so far this year are running behind last year's

record pace.

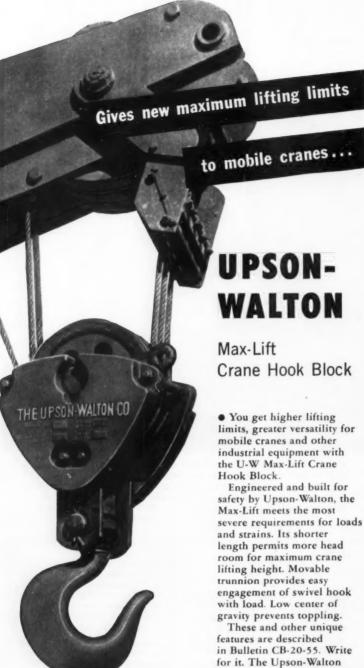
But the pressure for new construction continues to mount, and as the year progresses, the tempo of awards should pick up. Although some projects, many of them local public works, have been held up because of the sharp rise in the cost of borrowing money to finance them, many of them will very likely go ahead when the sponsors realize that today's higher interest rates will probably stick around for a long while. Also, the longer they wait, the more they'll have to pay for the projects because construction costs will keep rising. Interest rates will remain high, perhaps move higher because the demand for money is outpacing savings growth. Moreover, there's no sign that this demand for capital to finance new construction is going to taper off. The backlog of proposed heavy construction (in planning stage) rose rapidly in 1956 even though contract awards set a new high.

#### SOME BIG CONTRACT **AWARDS OF THE MONTH**

Foster Wheeler Corp., 165 Broadway, New York 6, N.Y. A 1, 780,000 lb per hr steam generating 5th unit for Oak Creek Station, Milwaukee Wis. Wisconsin Electric Power Co., 231 W. Michigan Ave., Milwaukee, Wis. \$39,500,000.

Bechtel Corp., 7th and Studebaker Rd., Los Angeles, Calif. Design and construct 400,000-kw steam electric generating station at Mandalay Beach, near Oxnard, Calif. Southern California Edison Co., 601 W. 5 St., Los Angeles 53, Calif. \$35,-

W. E. Robertson Co., 4015 W. Jefferson St., Los Angeles, Calif. Construct and finance housing (Capehart), Eng-15-029-56-87, Knox, Ky. U.S. Eng., 830 W. Broadway, Louisville, Ky. \$26,900,000. continued on page 247



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Avenue, Cleveland 11, Ohio.

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BEARING



# STOPS DUST, WEAR and REPAIR!

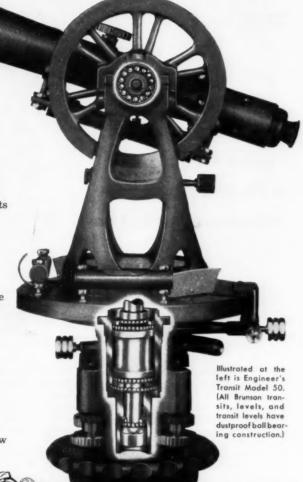
# BRUNSON INSTRUMENTS STAY ACCURATE WHERE OTHERS FAIL!

The construction boom means bigger and tougher jobs ahead. Right now is the time to replace those old, inadequate surveying instruments you've been putting up with—now's the time to get modern Brunson instruments with dustproof ball bearing construction!

Located in the spindle and telescope axis, Brunson ball bearings are permanently lubricated by an all-temperature grease and sealed against dust and moisture.

Preloaded and accurate to 5-millionths of an inch, these ball bearings provide highest possible instrument accuracy. With dust sealed out and lubricant sealed in, wear is practically eliminated by the smooth ball bearing action. That's why your Brunson instrument stays accurate and operable year-in-and-year-out, where others fail. You save hundreds of hours in on-work time, avoid costly errors, slash routine repair and maintenance expense to a level undreamed of in the past.

You pay no more for Brunson's exclusive ball bearing construction. You get much more—now when you need it! Mail coupon today!





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Company\_\_\_

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tion, our units increase power up to 100% depending on design and application of your engine, cut fuel costs, reduce noise and decrease or eliminate smoking. The removable rotating assembly makes them easier to maintain than other turbochargers.

We invite your inquiry on how you can improve the performance of your diesels by the application of our turbochargers.

There's little quarrel in the diesel industry about the air-cooling principle being highly-desirable in a turbocharger. It eliminates the need for extra plumbing on installation, puts no additional burden on an engine's cooling system and makes for a lighter, smaller unit in relation to output.

AiResearch turbochargers now available have been designed on this principle — which promises to be universal in the future. In addiBASIC SPECIFICATIONS FOR AIRESEARCH TURBOCHARGERS

MODEL	T-10	T-14	T-15	T-30-2	T-30-6
Diameter - in. nom.	9	11.5	15.25	15.25	16
Length — in.	9	14.12	16.75	17.25	21.75
Weight - Ib.	40	95	125	135	195
Output — Ib/min. (Standard Conditions)	25-40	35-65	35-65	70-95	115-175

THE GARRETT

#### CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

# CONTRACTS AWARDED ...

The Fluor Corp., Ltd., 2500 Atlantic St., Los Angeles, Calif. Design and construct 80,000 bbl. per day vacuum pipe still at refinery in Port Arthur, Tex. for The Texas Co., 135 E. 42 St., New York, N.Y. \$25,000,000.

George M. Brewster & Son, Inc., 275 West Fort Lee Rd., Bogota, N. J. Runway and taxiway support facilities at Griffiss Air Force Base, Eng-30-075-57-67, Rome, N. Y. U.S. Eng., 111 E. 16 St., New York 3, N. Y. \$16,742,731.

T. L. James & Co., Box 531, Ruston, La. Construct Port Allen Lock about 1 mile south of Port Allen, Inv. 57-72, Louisiana. U.S. Eng., foot of Prytania St., New Orleans, La. \$11,747,419.

Fluor Corp., 2500 Atlantic Ave., Los Angeles, Calif. Alkylation unit to produce 800,000 bbl per year high grade gasoline, Anacortes, Wash. Shell Oil Co., 50 W. 50th St., New York, N.Y. \$10,000,000.

Amoco Chemicals Corp., 910 S. Michigan Ave., Chicago 5, Ill. Chemical plant in midwest applying new process for production of phthalic anhydride, isopthalic acid, terephtalic acid, dimethyl terephthalate isophthalic and benzoic acid, Hammond, Inc. Standard Oil Co. of Ind., 910 S. Michigan Ave., Chicago 5, Ill. \$10,000,000.

Johnson, Drake & Piper, Inc., Baker Bldg., Minneapolis, Minn. Plant, including three 1-story buildings, administration, boiler installations, warehouse totaling 565,000 sq. ft. in Rochester, Minn. for International Business Machines Corp., 590 Madison Ave., New York 22, N.Y. \$8,000,000.

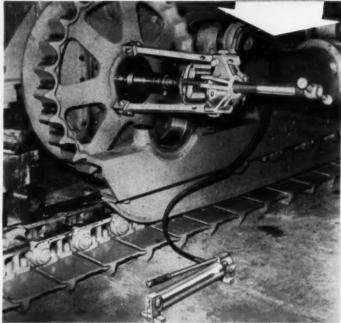
General Electric Co., River Rd., Schenectady, N. Y. A 240,000-kw generator plant unit at Sam Bertron Station on Ship Channel near San Jacinto Monument, Houston, Tex. for Houston Lighting & Power Co., 1016 Walker St., Houston, Tex. \$6,500,000.

Baltimore Contractors, Inc., 711 S. Central Ave., Baltimore, Md. General construction, repair and alteration work for east wing of infirmary for city hospital, Baltimore, Md. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore, Md. \$2,147,000.

SPROCKET WITH 4- PUMP STROKES?

HYDRAULIC UNITS ARE DOING IT REGULARLY IN SHOP OR FIELD

> HERE'S HOW



A. C. sprocket being removed with OTC Power Twin hydraulic ram and adaptors.

Contractors report saving hours, pulling and installing tractor sprockets with portable OTC hydraulic pullers and attachments. Regardless of make, one man with an OTC unit can pull and install a sprocket or track king pin in minutes using an OTC hand or electric pump.

OTC Power Twin hydraulic 50 or 100 ton ram, with simple accessories also remove and install bearings, gears, sheaves or pulleys on all makes of equipment, without damage to the parts—pay for themselves in time saved on one job.

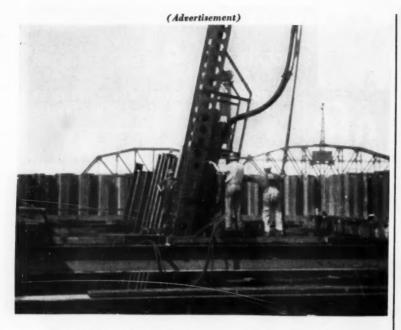


Ask for free new Contractors and Tractor Manual.

# OWATONNA TOOL COMPANY

Manual

380 Cedar Street · Owatonna, Minnesota



Driving one of the 2,568 H-beam 12-in. and 14-in. bearing piles for pier foundations of the 9,500-ft bridge over Newark Bay on the new 8-mile expressway connecting the New Jersey Turnpike with the Holland Tunnel under the Hudson River to New York City. The piles ranged from 67 to 128 ft long, and had to be driven with extreme accuracy through sticky soil to rock. To drive the piles, the contractor, Dravo Corporation, used 983 and 1083 Double-Acting Pile Hammers and an S8 Single-Acting Pile Hammer manufactured by McKiernan-Terry Corporation, 110A Richards Ave., Dover, New Jersey.

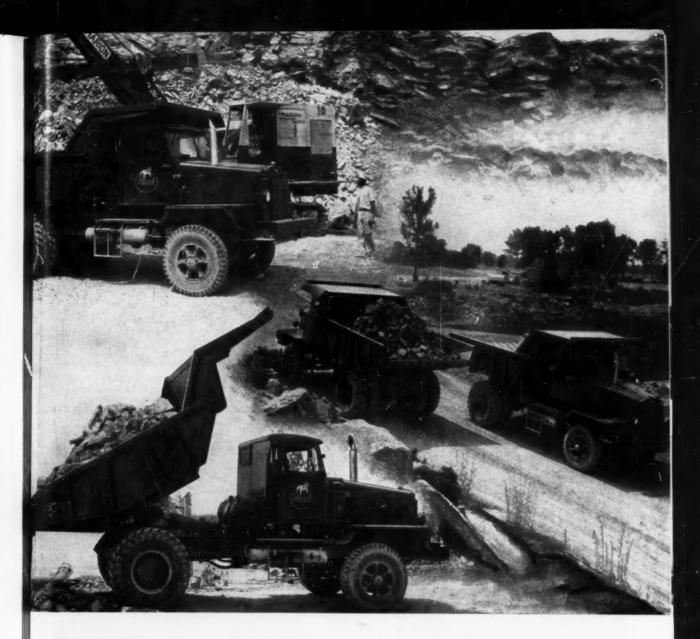


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# "loading...hauling...dumping... you can't beat 'em!"

That's what Mr. Arnold R. Lyon of Harry Berry, Inc. says about their Mack LRX dumpers. As general manager of their operation in Hopkinsville, Kentucky, Mr. Lyon appreciates the dollar-and-sense value of Mack trucks.

"Since ours is mostly short hauling, the strain from loading, dumping, and steep grades really gives our trucks a tough workout. Moreover, we find that we are able to produce more work with our Macks because their balance, short turning radius, and maneuverability

speed up spotting under the shovel and dumping.

"Our Macks haul 16- to 17-ton loads day in and day out... averaging 2 gallons of fuel per hour. In 3½ months, outside of routine servicing, we have not had a single second of downtime. But aside from the economy and performance, our drivers like them better than other makes... easier to handle... better riding... greater sense of confidence. Certainly, it's been our experience that you can't buy a better truck than a Mack."

Mr. Lyon has learned about Macks from experience. If you have a hauling job, especially a tough one, why not let your Mack dealer or representative tell you about all the satisfied Mack users in your area. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK first name for TRUCKS

# or Spread the Way You Want



FEEDS LIMESTONE INTO HOPPER at controlled rate for Cia. Peruna de Cemento Portland, Atacongo, Peru. Operator controls discharge rate from tractor seat, stops ejector when 8-yard crusher is full. Here two 25-yard Movalls, powered by Cat DW20 tractors, replace six 8-yard sidedump trucks.



SPREADS PERVIOUS FILL IN 18" LIFTS at Santa Felicia Dam in California. Movall dumps behind wagon tires, safely at any speed tractor can travel because dozer-type ejector keeps center of gravity low. Depth of spread is uniform, controlled by speed of tractor (4" at 20 mph., 18" at 3 mph.). Movalls also can dump while turning at end of road fill, thus retaining fines on top.

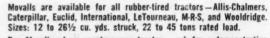


DUMPS OVER EDGE OF FILL with tractor either straight ahead or jackknifed. Drive wheels are always on good footing; center of gravity stays low. Positive ejection with 140,000-lb. push enables Orlando Construction Co., to dump 25-yard load of rock and dirt in 12-14 seconds on Massachusetts Turnpike. Movalls dump cleanly and quickly any material you can top load.

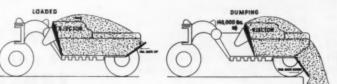


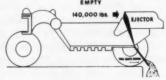
DUMPS ON GRADE safely from any position or on any level. Load is pushed straight back by 140,000-lb. push of dozer-type ejector. There's no raising of load, no danger of wagon tipping or damaging mechanism. Frozen earth and rock being dumped here on St. Lawrence Seaway by C. A. Pitts, Ltd., was loaded by 6-yard shovel.

HOW IT WORKS



Buy Movalls where you buy your tractor...ask for a demonstration on our buy-and-try plan. C & D Division, Yuba Manufacturing Co., 701 East H St., Benicia, Calif. Phone 628.





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It's New Again with THORITE and THOROSEAL

Freeze-thaw cycle following water and moisture penetration, also swelling of reinforcing rods from moisture contact, cause masonry destruction.





BRIDGE OVER CONCORD RIVER ROUTE 3, BELLERICA, MASS.

Workmen on scaffold patch spalled and cracked concrete with THORITE and seal surface with THOROSEAL.



Area at left chipped to sound masonry. It will then be patched with THORITE Nonshrink, Nonslump 20-Minute Set Patching Mortar, without necessity of costly forming, finished by application of Thoroseal.

Request Circular No. 16 and 20.

Write for our 16 page "How to Do 9t"

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA - CENTERVILLE, INDIANA



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1.80 per line, minimum 3 lines. To figure advance payment count 5 average words as a line. Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Positions Wanted undisplayed advertising rate is one-half of above rate payable in advance.

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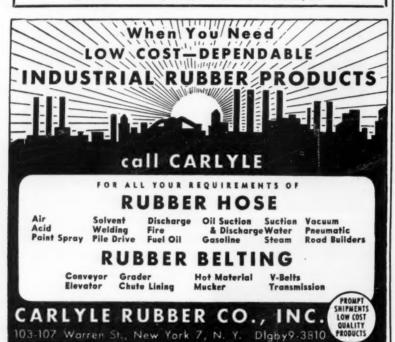
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The advertising rate is \$18.90 per inch for Equipment & Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment Opportunities—\$26.00 per inch, subject to Agency commission.

An advertising inch is measured %" vertically on one column. 3 columns—30 inches—to a page.

Send New Advertisements and inquiries to Classified Adv. Div. CONSTRUCTION METHODS & EQUIPMENT, P. O. Box 12, N.Y. 36, N.Y. March issue closes February 26th.



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750/20	900/20	1100x24
Used Tire,	Used Tire.	New
Tube,	Tube,	No Tax
\$14.95	\$24.95	\$95.95

Post Office Box 846 Phoenix, Arizona

REPLIES (Box No.): Address to office negrest you c/o this publication, Classified Adv. Div. NEW YORK: P.O. Box 12 (36) CHICAGO: 520 N. Michigan Ave. (11) SAN FRANCISCO: 68 Post St. (4)

### EMPLOYMENT

Sales Representative, Canadian, ten years experience in all types of heavy construction equipment, speaks French, German, Italian and native tongue English, would like position representing United States manufacturer overseas. Good references and sales record available. PW-3954, Construction Methods.

# "SEARCHLIGHT" Can Help You!

Hundreds of miscellaneous business problems that confront you from time to time, can be solved through the use of the SEARCH-LIGHT SECTION of CONSTRUC-TION METHODS AND EQUIP-MENT.

When you want to buy or sell used or surplus new Construction equipment and/or accessories, or have other business wants - advertise them in the SEARCHLIGHT SECTION quick, profitable results!

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# Construction Methods EQUIPMENT

CLASSIFIED ADVERTISING F. J. Eberle, Business Manager

Employment Opportunities

(Used or Surplus New) For Sale

Equipment

330 West 42nd St., New York 36-LO 4-3000 E. E. WEYENETH, Advertising Sales Manager



Member of Associated Business Publications and Audit Bureau of Circulations

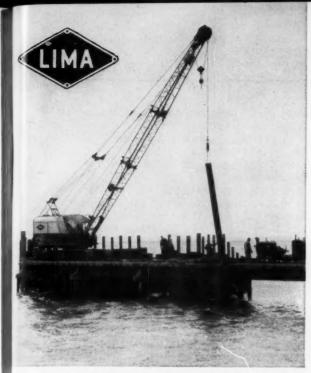
Sales Representatives New York 36, 330 W. 42nd St. Philadelphia 3, 17th and Sansom Sts. L. S. KELLY, JR. Atlanta 3, 801 Rhodes-Haverty Bldg. DOUGLAS C. BILLIAN Cleveland 15, 1510 Hanna Bldg. W. E. DONNELL

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Lima Type 604 lowering pile into position on the Manahawken Bay Bridge, Ocean County, N. J.

52

g.



Lima Type 604 dredging sand from single-cell cofferdam prior to driving piling.

# LIMAS proved to be everything Brann & Stuart wanted in heavy-duty precision-type cranes



Lima Type 34-T (left) and two Type 604's, part of the Brann and Stuart Company's team of eight Limas.

Says Amos Rogers, Jr., president of Brann and Stuart, Philadelphia, Pa., "We purchased our first Lima machines in 1950, and they proved to be everything we were looking for in heavy-duty precision-type cranes. In 1952 we purchased two additional Lima rigs, and, right now, we have a fleet of eight Limas, made up of 2 Lima 34's, 2 Lima 34-T's, 3 Lima 604's and 1 Lima 703-SC.

"Our operating people like the Lima ease of operation, and they have proved very economical to run. Our distributor has given us excellent service on these machines whenever we have needed it."

Brann and Stuart's contract calls for construction of 16 piers and 2 abutments for the Manahawken Bay Bridge job, Ocean County, N. J. The work involves building large cofferdams for founding these elements. It is here that the Limas, with their high maneuverability, come into use, dredging the sea bottom to the necessary depth. Read what Mr. Rogers has to say about how they are performing: "It is on this type

of work that our Lima machines really excel for us. You may be sure we have been very well pleased."

This contractor's experience is typical of many others-get to know Lima quality, and you'll want more of them working for you. It will pay you to get complete details on the Limas with capacities best suited to your job requirements. Call your nearby Lima distributor today, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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# Methods Memo . . .



#### **Nine Bags Full**

Each of the nine big earthmoving machines Le-Tourneau-Westinghouse Co. displayed at the ARBA Road Show in Chicago arrived in a paper bag.

The idea of putting earthmovers in paper bags like so many gumdrops was partly to protect the brightly painted, highly polished rigs on the trip from Peoria to Chicago. It also was partly to help keep the secret of what's new in Le-Tourneau-Westinghouse's line until the show opened.

The bags were among the largest ever produced. They were made of laminated paper reinforced by fiberglass. The paper in them weighed more than a ton. Bemis Brothers Bag Co. of St. Louis had to hire an auditorium to make the bags because there was no place large enough in their plant to lay them out.

#### Tools of the Future

Within the next few years, helicopters and atomic energy may become tools of the construction industry.

Henry H. Reichhold, president of Reichhold Chemicals, Inc., says builders soon will be working with plastic materials funneled from helicopters hovering over the site. Walls and foundations will be poured through hoses from aircraft fitted with equipment similar to that now used for concrete mixing, he says.

"It may seem fantastic," Reichhold adds, "but so did spraying of crops from the air when it was originally suggested."

Maj. Gen. Emerson Itschner, Chief of Army Engineers, points out the potential value of atomic energy in earthmoving.

"Atomic energy," according to Gen. Itschner, "is a super-high explosive which is potentially a new engineering tool of unprecedented power.

With it, we conceivably can produce landslides, divert rivers, and move earth and rock masses on a scale which can add new dimensions to the field of civil engineering."

He said peaceful use of this tremendous explosive depends largely on the success of efforts to clean it up—that is, get rid of harmful after effects such as radioactive fallout and soil and water contamination. The Corps of Engineers, the Atomic Energy Commission, and other agencies, he said, are working on this problem.

#### LeTourneau Becomes "AR-GEE"

R.G. LeTourneau, Inc., will begin producing earthmoving equipment again next year after a five-year absence from the field. Robert G. LeTourneau, president of the firm, announced at the ARBA Road Show in Chicago that he will re-enter the field in 1958 with machines that "will have the u'timate in traction and mobility."

His new earthmovers will be driven by "electric wheels," powered by diesel-electric dynamos geared directly to each wheel and to all other points where power is needed. A high-horsepower diesel engine will drive ac and dc generators.

The new line will be sold under a new trade name—"AR-GEE"—after the "R.G." in president LeTourneau's name.

LeTourneau sold his earthmoving equipment business to Westinghouse Air Brake Co. for \$31 million four years ago. Included in the sale was an agreement that LeTourneau would refrain from building and selling earthmoving equipment for a period of five years, ending May 1, 1958.

Since that sale, R.G. LeTourneau, Inc., has produced heavy-duty logging, materials handling, land clearing, offshore drilling, and off-road transportation equipment at plants near Longview, Tex., and Vicksburg, Miss.

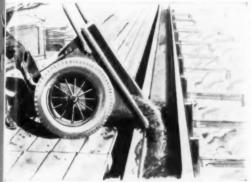
#### Watch Out!

Competition for highway jobs is getting stiffer despite the fact that more work is available than ever before.

The Bureau of Public Roads reports that contractor bid prices leveled off in the final quarter of 1956 after moving sharply higher in each of the five previous quarters. The BPR's composite mile bid price index now stands at 140.5 (based on 1946=100). This is a gain of only 0.2% in the fourth quarter of 1956, but the index is 7.3% higher than its level at the end of 1955.

BPR also points out that there were more bidders for federal-aid highway contracts than there were a year ago. During the fourth quarter of 1956, there were an average of about seven bidders for each job. A year earlier, the average number of bidders per job was 6.1.

# guide to BETTER CONCRETING\*



Correct placing methods result in a better job

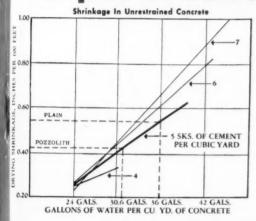
# correct placing is important

Much of the time and money spent for patch-up can be saved by placing concrete carefully. Concrete should be dropped vertically into forms to avoid separation, caused by striking the side and bouncing off, and resulting in stone pockets and sand streaking.

A placard entitled "Do's and Don'ts of Concrete Placing" illustrates and describes the above and other important points. Copies available for posting at job sites or on bulletin boards.

\*From booklet by this name. Covers points that can make the difference between a good job and a poor one. Copy on request.

# a quiz on CONCRETE



# Question: How can minimum shrinkage be obtained?

Answer: Whatever the cement content of a mix or the water-cement ratio, drying shrinkage is governed mainly by unit water content—the amount of water required per cubic yard of concrete.

Because Pozzolith is key to the lowest possible unit water content for a given workability it provides minimum shrinkage...also improves other basic qualities in the hardened state.

For uniform, better quality concrete, always specify Pozzolith Ready-Mixed Concrete—available from your local ready-mix producer.



# THE MASTER BUILDERS CO.

Division of American-Marietta Company
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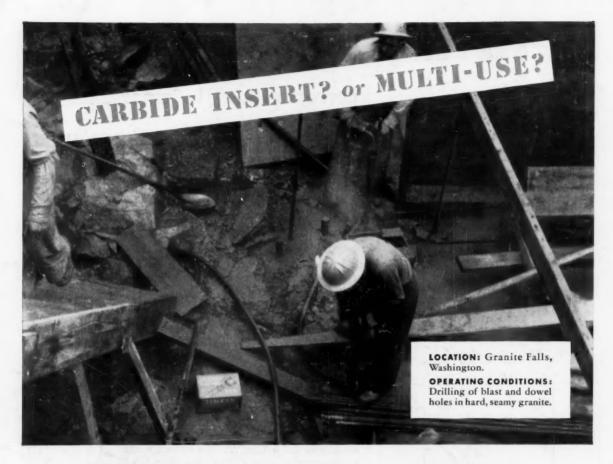
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talith Ready-Mixed Concrete makes available
this possible unit water content for a given
this lity. . for dense, segregation-free fountion and other concrete construction

With Pozzolith Ready-Mixed Concrete, control of rate of hardening gives desired handling and finishing time under widely varying job conditions... for slab and other concrete work. Control of entrained air, another feature of Pozzolith Ready-Mixed Concrete, provides optimum air content without sacrificing other qualities, for sawage plants and other exposed concrete



# TIMKEN® carbide insert bits give more hole per bit through blocky granite on Granite Falls Fishway

THE Scheumann & Johnson Company of Seattle had to drill blast and dowel holes in extremely hard, seamy granite when constructing baffles for the world's largest "vertical-baffle" salmon fishway at Granite Falls, Washington. For highest economy drilling through this hard ground, they chose Timken® carbide insert bits for the job.

Timken carbide insert bits permitted high speed drilling with minimum bit changes. And the job superintendent reports that the Timken carbide insert bits made it possible to drill out full increments of drill steel.

But Timken carbide insert bits may not be the best answer for all your drilling problems!

In softer, less abrasive ground, Timken multi-use bits, correctly controlled and reconditioned, give you the lowest cost per foot of hole when you can drill out full increments of drill steel.

Both types of Timken bits are interchangeable in the same thread series. And a wide range of different Timken bits fit the same drill steel. When the ground changes, you can switch bits quickly and easily, right on the job.

The Timken Rock Bit Engineering Service can offer you over 20 years of experience in recommending the best bit for the job. We'll be happy to help you. Write: The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded multi-use rock bit



Timken threaded carbide insert rock bit

your best bet for the best bit ...for every job TIMKEN